JMAP
REGENTS BY TYPE

The NY Geometry Regents Exam Questions
from Fall 2008 to August 2015 Sorted by Type

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Geometry Multiple Choice Regents Exam Questions

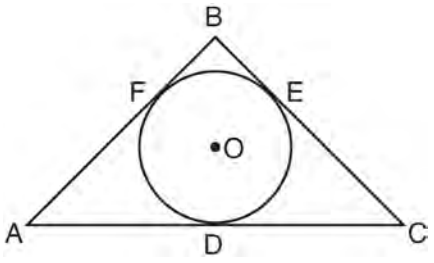
1 A student wrote the sentence "4 is an odd integer." What is the negation of this sentence and the truth value of the negation?
1) 3 is an odd integer; true
2) 4 is not an odd integer; true
3) 4 is not an even integer; false
4) 4 is an even integer; false

2 Which equation represents a line that is parallel to the line whose equation is $y = \frac{3}{2}x - 3$ and passes through the point $(1,2)$?
1) $y = \frac{3}{2}x + \frac{1}{2}$
2) $y = \frac{2}{3}x + \frac{4}{3}$
3) $y = \frac{3}{2}x - 2$
4) $y = -\frac{2}{3}x + \frac{8}{3}$

3 Which statement is the negation of "Two is a prime number" and what is the truth value of the negation?
1) Two is not a prime number; false
2) Two is not a prime number; true
3) A prime number is two; false
4) A prime number is two; true

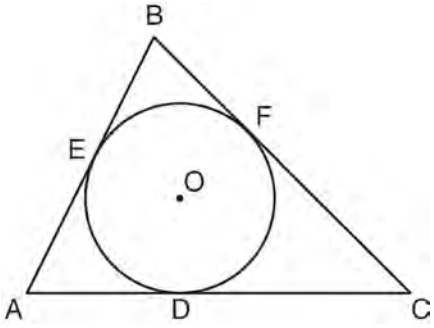
4 The angles of triangle ABC are in the ratio of $8:3:4$. What is the measure of the *smallest* angle?
1) 12º
2) 24º
3) 36º
4) 72º

5 In the diagram below, $\overline{AB}$, $\overline{BC}$, and $\overline{AC}$ are tangents to circle O at points F, E, and D, respectively, $AF = 6$, $CD = 5$, and $BE = 4$.



What is the perimeter of $\triangle ABC$?
1) 15
2) 25
3) 30
4) 60

6 In the diagram below, $\triangle ABC$ is circumscribed about circle O and the sides of $\triangle ABC$ are tangent to the circle at points D, E, and F.

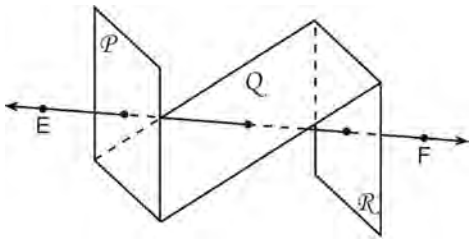


If $AB = 20$, $AE = 12$, and $CF = 15$, what is the length of $\overline{AC}$?
1) 8
2) 15
3) 23
4) 27

7 In scalene triangle ABC, $m\angle B = 45$ and $m\angle C = 55$. What is the order of the sides in length, from longest to shortest?

1) $\overline{AB}, \overline{BC}, \overline{AC}$
2) $\overline{BC}, \overline{AC}, \overline{AB}$
3) $\overline{AC}, \overline{BC}, \overline{AB}$
4) $\overline{BC}, \overline{AB}, \overline{AC}$

8 As shown in the diagram below, $\overleftrightarrow{EF}$ intersects planes $\mathcal{P}$, Q, and $\mathcal{R}$.



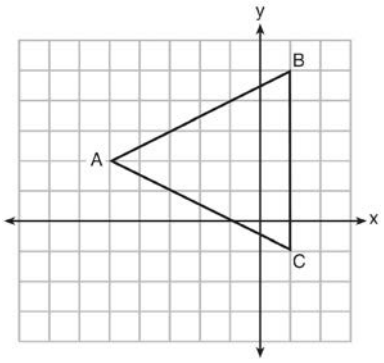
If $\overleftrightarrow{EF}$ is perpendicular to planes $\mathcal{P}$ and $\mathcal{R}$, which statement must be true?

1) Plane $\mathcal{P}$ is perpendicular to plane Q.
2) Plane $\mathcal{R}$ is perpendicular to plane $\mathcal{P}$.
3) Plane $\mathcal{P}$ is parallel to plane Q.
4) Plane $\mathcal{R}$ is parallel to plane $\mathcal{P}$.

9 The volume of a rectangular prism is 144 cubic inches. The height of the prism is 8 inches. Which measurements, in inches, could be the dimensions of the base?

1) 3.3 by 5.5
2) 2.5 by 7.2
3) 12 by 8
4) 9 by 9

10 Triangle ABC is graphed on the set of axes below.



What are the coordinates of the point of intersection of the medians of $\triangle ABC$?

1) $(-1, 2)$
2) $(-3, 2)$
3) $(0, 2)$
4) $(1, 2)$

11 The diameter of a sphere is 15 inches. What is the volume of the sphere, to the *nearest tenth of a cubic inch*?

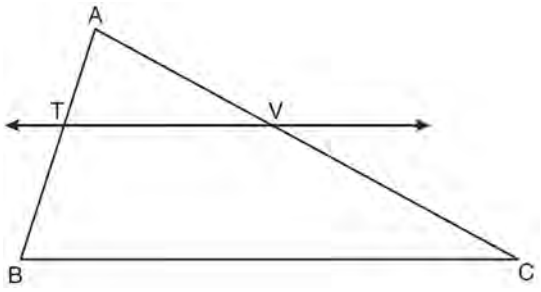
1) 706.9
2) 1767.1
3) 2827.4
4) 14,137.2

12 What is the image of the point $(-5, 2)$ under the translation $T_{3,-4}$?

1) $(-9, 5)$
2) $(-8, 6)$
3) $(-2, -2)$
4) $(-15, -8)$

13 For a triangle, which two points of concurrence could be located outside the triangle?
1) incenter and centroid
2) centroid and orthocenter
3) incenter and circumcenter
4) circumcenter and orthocenter

14 In the diagram below of $\triangle ABC$, $\overleftrightarrow{TV} \parallel \overline{BC}$, $AT = 5$, $TB = 7$, and $AV = 10$.



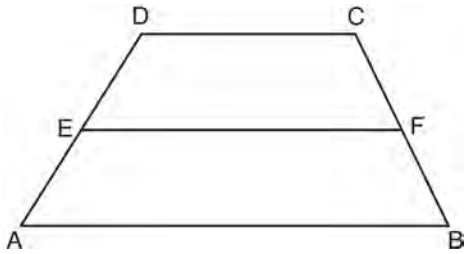
What is the length of $\overline{VC}$?
1) $3\frac{1}{2}$
2) $7\frac{1}{7}$
3) 14
4) 24

15 In $\triangle RST$, $m\angle R = 58$ and $m\angle S = 73$. Which inequality is true?
1) $RT < TS < RS$
2) $RS < RT < TS$
3) $RT < RS < TS$
4) $RS < TS < RT$

16 Segment AB is the diameter of circle M. The coordinates of A are $(-4,3)$. The coordinates of M are $(1,5)$. What are the coordinates of B?
1) $(6,7)$
2) $(5,8)$
3) $(-3,8)$
4) $(-5,2)$

17 In $\triangle ABC$, $m\angle B < m\angle A < m\angle C$. Which statement is *false*?
1) $AC > BC$
2) $BC > AC$
3) $AC < AB$
4) $BC < AB$

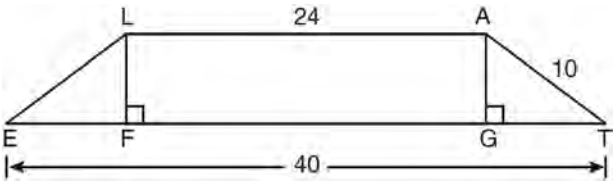
18 In the diagram below, $\overline{EF}$ is the median of trapezoid $ABCD$.



If $AB = 5x - 9$, $DC = x + 3$, and $EF = 2x + 2$, what is the value of x?
1) 5
2) 2
3) 7
4) 8

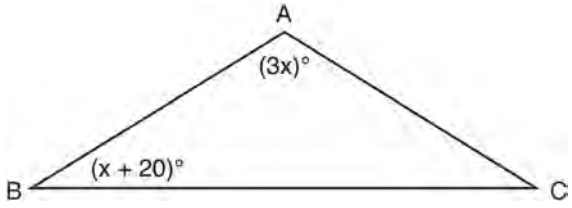
19 In $\triangle DEF$, $m\angle D = 3x + 5$, $m\angle E = 4x - 15$, and $m\angle F = 2x + 10$. Which statement is true?
1) $DF = FE$
2) $DE = FE$
3) $m\angle E = m\angle F$
4) $m\angle D = m\angle F$

20 In the diagram below, $LATE$ is an isosceles trapezoid with $\overline{LE} \cong \overline{AT}$, $LA = 24$, $ET = 40$, and $AT = 10$. Altitudes $\overline{LF}$ and $\overline{AG}$ are drawn.



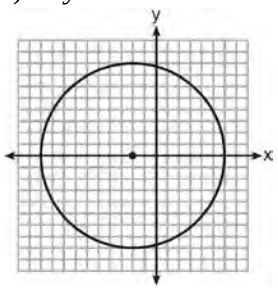
What is the length of $\overline{LF}$?
1) 6
2) 8
3) 3
4) 4

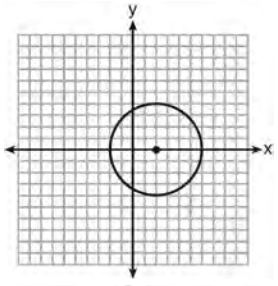
21 In the diagram below of $\triangle ABC$, $\overline{AB} \cong \overline{AC}$, $m\angle A = 3x$, and $m\angle B = x + 20$.

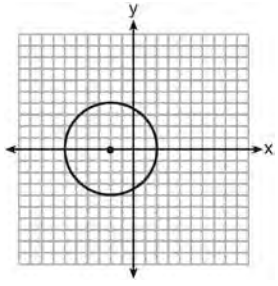


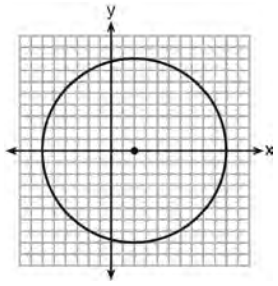
What is the value of x?
1) 10
2) 28
3) 32
4) 40

22 Which graph represents a circle whose equation is $(x + 2)^2 + y^2 = 16$?

1)


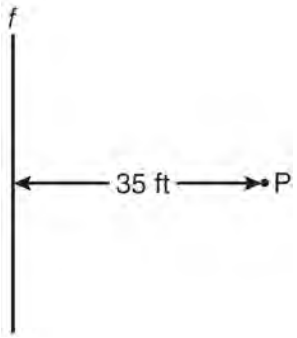
2)


3)


4)


23 If $\triangle W'X'Y'$ is the image of $\triangle WXY$ after the transformation $R_{90°}$, which statement is *false*?
1) $XY = X'Y'$
2) $\overline{WX} \parallel \overline{W'X'}$
3) $\triangle WXY \cong \triangle W'X'Y'$
4) $m\angle XWY = m\angle X'W'Y'$

24 A man wants to place a new bird bath in his yard so that it is 30 feet from a fence, *f*, and also 10 feet from a light pole, *P*. As shown in the diagram below, the light pole is 35 feet away from the fence.

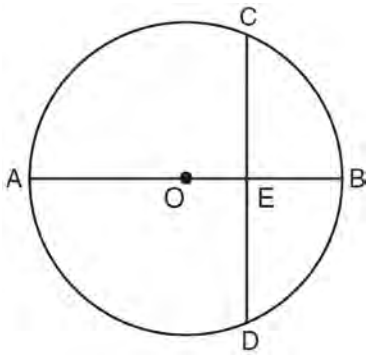


How many locations are possible for the bird bath?
1) 1
2) 2
3) 3
4) 0

25 When a quadrilateral is reflected over the line $y = x$, which geometric relationship is *not* preserved?
1) congruence
2) orientation
3) parallelism
4) perpendicularity

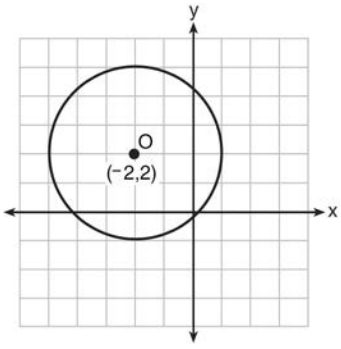
26 Which reason could be used to prove that a parallelogram is a rhombus?
1) Diagonals are congruent.
2) Opposite sides are parallel.
3) Diagonals are perpendicular.
4) Opposite angles are congruent.

27 In the diagram below of circle *O*, diameter $\overline{AOB}$ is perpendicular to chord $\overline{CD}$ at point *E*, $OA = 6$, and $OE = 2$.



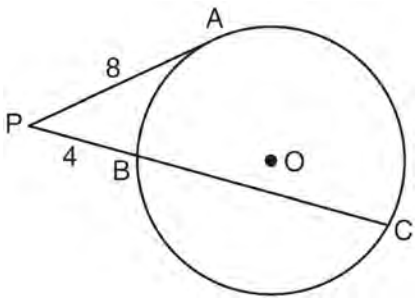
What is the length of $\overline{CE}$?
1) $4\sqrt{3}$
2) $2\sqrt{3}$
3) $8\sqrt{2}$
4) $4\sqrt{2}$

28 What is an equation of circle *O* shown in the graph below?



1) $(x+2)^2 + (y-2)^2 = 9$
2) $(x+2)^2 + (y-2)^2 = 3$
3) $(x-2)^2 + (y+2)^2 = 9$
4) $(x-2)^2 + (y+2)^2 = 3$

29 In the diagram below of circle O, $\overline{PA}$ is tangent to circle O at A, and $\overline{PBC}$ is a secant with points B and C on the circle.



If $PA = 8$ and $PB = 4$, what is the length of $\overline{BC}$?

1) 20
2) 16
3) 15
4) 12

30 In $\triangle PQR$, $\angle PRQ$ is a right angle and $\overline{RT}$ is drawn perpendicular to hypotenuse $\overline{PQ}$. If $PT = x$, $RT = 6$, and $TQ = 4x$, what is the length of $\overline{PQ}$?

1) 9
2) 12
3) 3
4) 15

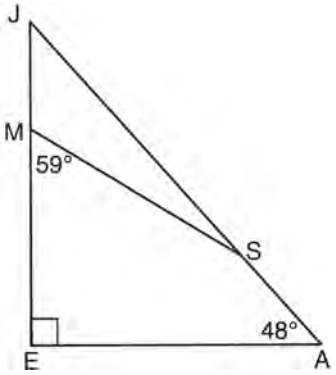
31 When solved graphically, what is the solution to the following system of equations?

$$y = x^2 - 4x + 6$$

$$y = x + 2$$

1) $(1,4)$
2) $(4,6)$
3) $(1,3)$ and $(4,6)$
4) $(3,1)$ and $(6,4)$

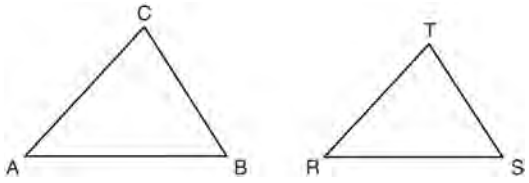
32 In the diagram of $\triangle JEA$ below, $m\angle JEA = 90$ and $m\angle EAJ = 48$. Line segment MS connects points M and S on the triangle, such that $m\angle EMS = 59$.



What is $m\angle JSM$?

1) 163
2) 121
3) 42
4) 17

33 In the diagram below, $\triangle ABC \sim \triangle RST$.



Which statement is *not* true?

1) $\angle A \cong \angle R$
2) $\frac{AB}{RS} = \frac{BC}{ST}$
3) $\frac{AB}{BC} = \frac{ST}{RS}$
4) $\frac{AB + BC + AC}{RS + ST + RT} = \frac{AB}{RS}$

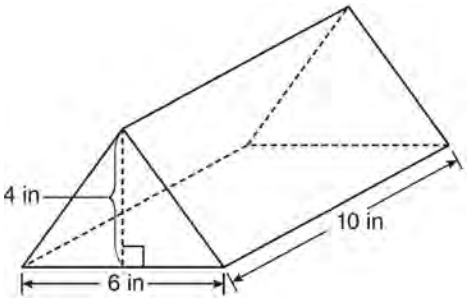
34 In circle O, a diameter has endpoints $(-5,4)$ and $(3,-6)$. What is the length of the diameter?

1) $\sqrt{2}$
2) $2\sqrt{2}$
3) $\sqrt{10}$
4) $2\sqrt{41}$

35 What is the slope of a line perpendicular to the line whose equation is $20x - 2y = 6$?

1) -10
2) $-\frac{1}{10}$
3) 10
4) $\frac{1}{10}$

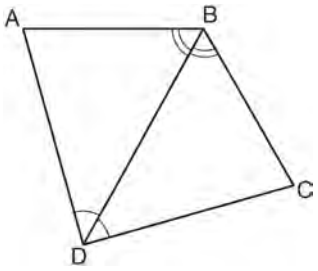
36 A packing carton in the shape of a triangular prism is shown in the diagram below.



What is the volume, in cubic inches, of this carton?

1) 20
2) 60
3) 120
4) 240

37 The diagram below shows a pair of congruent triangles, with $\angle ADB \cong \angle CDB$ and $\angle ABD \cong \angle CBD$.



Which statement must be true?

1) $\angle ADB \cong \angle CBD$
2) $\angle ABC \cong \angle ADC$
3) $\overline{AB} \cong \overline{CD}$
4) $\overline{AD} \cong \overline{CD}$

38 Which set of numbers could be the lengths of the sides of an isosceles triangle?

1) $\{1,1,2\}$
2) $\{3,3,5\}$
3) $\{3,4,5\}$
4) $\{4,4,9\}$

39 If the vertex angles of two isosceles triangles are congruent, then the triangles must be

1) acute
2) congruent
3) right
4) similar

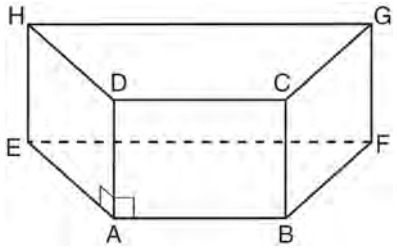
40 What is the equation of a line passing through $(2,-1)$ and parallel to the line represented by the equation $y = 2x + 1$?

1) $y = -\frac{1}{2}x$
2) $y = -\frac{1}{2}x + 1$
3) $y = 2x - 5$
4) $y = 2x - 1$

41 Which statement is true about every parallelogram?

1) All four sides are congruent.
2) The interior angles are all congruent.
3) Two pairs of opposite sides are congruent.
4) The diagonals are perpendicular to each other.

42 In the prism shown below, $\overline{AD} \perp \overline{AE}$ and $\overline{AD} \perp \overline{AB}$.



Which plane is perpendicular to $\overline{AD}$?

1) HEA
2) BAD
3) EAB
4) EHG

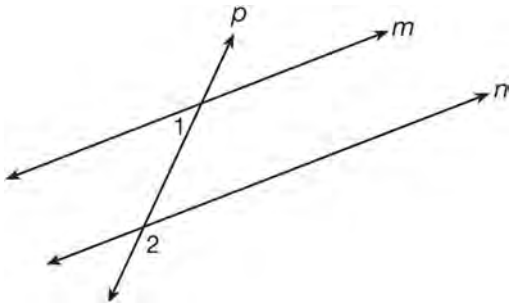
43 Which equation represents the line that is perpendicular to $2y = x + 2$ and passes through the point $(4,3)$?

1) $y = \frac{1}{2}x - 5$
2) $y = \frac{1}{2}x + 1$
3) $y = -2x + 11$
4) $y = -2x - 5$

44 When $\triangle ABC$ is dilated by a scale factor of 2, its image is $\triangle A'B'C'$. Which statement is true?

1) $\overline{AC} \cong \overline{A'C'}$
2) $\angle A \cong \angle A'$
3) perimeter of $\triangle ABC$ = perimeter of $\triangle A'B'C'$
4) 2(area of $\triangle ABC$) = area of $\triangle A'B'C'$

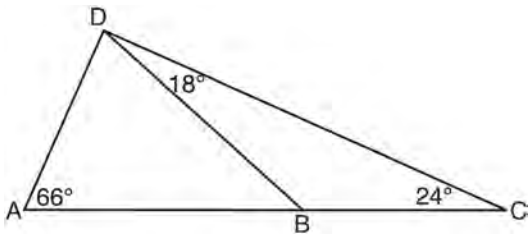
45 As shown in the diagram below, lines m and n are cut by transversal p.



If $m\angle 1 = 4x + 14$ and $m\angle 2 = 8x + 10$, lines m and n are parallel when x equals

1) 1
2) 6
3) 13
4) 17

46 As shown in the diagram of $\triangle ACD$ below, B is a point on $\overline{AC}$ and $\overline{DB}$ is drawn.



If $m\angle A = 66$, $m\angle CDB = 18$, and $m\angle C = 24$, what is the longest side of $\triangle ABD$?

1) $\overline{AB}$
2) $\overline{DC}$
3) $\overline{AD}$
4) $\overline{BD}$

47 The angle formed by the radius of a circle and a tangent to that circle has a measure of

1) 45°
2) 90°
3) 135°
4) 180°

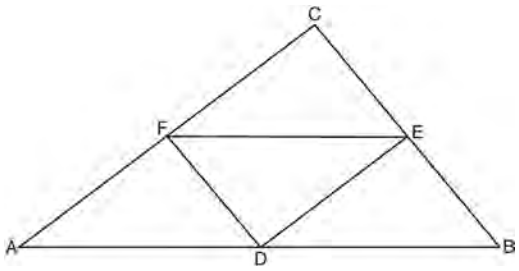
48 Parallelogram $ABCD$ has coordinates $A(1,5)$, $B(6,3)$, $C(3,-1)$, and $D(-2,1)$. What are the coordinates of E, the intersection of diagonals $\overline{AC}$ and $\overline{BD}$?

1) $(2,2)$
2) $(4.5,1)$
3) $(3.5,2)$
4) $(-1,3)$

49 When a dilation is performed on a hexagon, which property of the hexagon will *not* be preserved in its image?

1) parallelism
2) orientation
3) length of sides
4) measure of angles

50 In the diagram of $\triangle ABC$ shown below, D is the midpoint of $\overline{AB}$, E is the midpoint of $\overline{BC}$, and F is the midpoint of $\overline{AC}$.



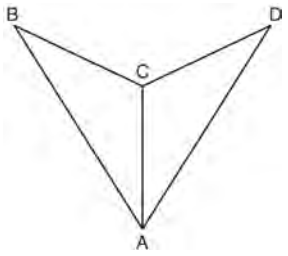
If $AB = 20$, $BC = 12$, and $AC = 16$, what is the perimeter of trapezoid $ABEF$?

1) 24
2) 36
3) 40
4) 44

51 In $\triangle ABC$ and $\triangle DEF$, $\frac{AC}{DF} = \frac{CB}{FE}$. Which additional information would prove $\triangle ABC \sim \triangle DEF$?

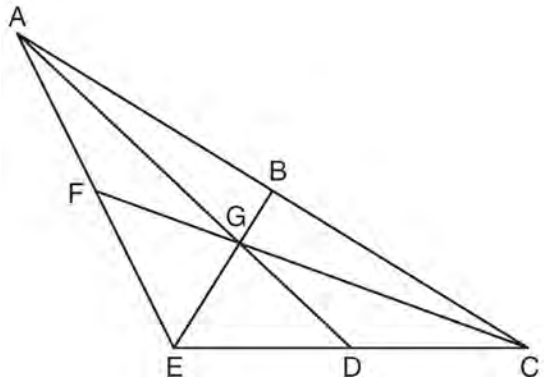
1) $AC = DF$
2) $CB = FE$
3) $\angle ACB \cong \angle DFE$
4) $\angle BAC \cong \angle EDF$

52 As shown in the diagram below, $\overline{AC}$ bisects $\angle BAD$ and $\angle B \cong \angle D$.



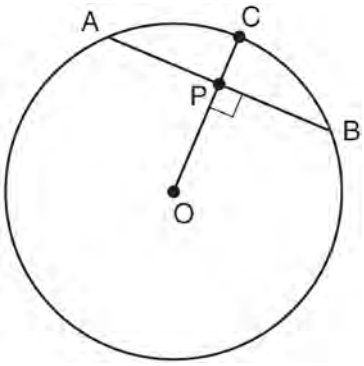
Which method could be used to prove $\triangle ABC \cong \triangle ADC$?
1) SSS
2) AAA
3) SAS
4) AAS

53 In the diagram below of $\triangle ACE$, medians $\overline{AD}$, $\overline{EB}$, and $\overline{CF}$ intersect at G. The length of $\overline{FG}$ is 12 cm.



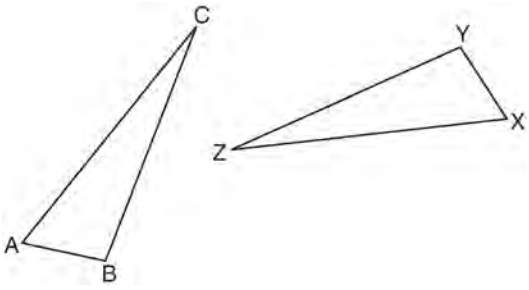
What is the length, in centimeters, of $\overline{GC}$?
1) 24
2) 12
3) 6
4) 4

54 In the diagram below of circle O, radius $\overline{OC}$ is 5 cm. Chord $\overline{AB}$ is 8 cm and is perpendicular to $\overline{OC}$ at point P.



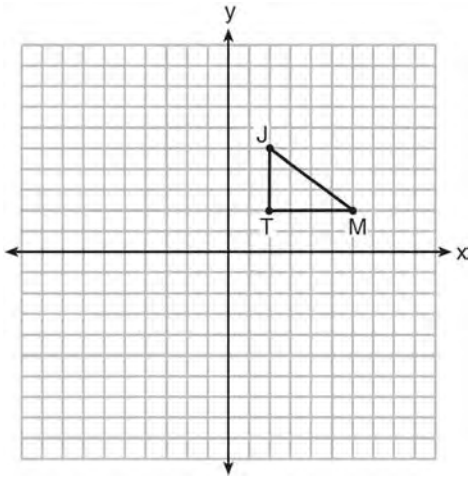
What is the length of $\overline{OP}$, in centimeters?
1) 8
2) 2
3) 3
4) 4

55 In the diagram below, $\triangle ABC \cong \triangle XYZ$.



Which statement must be true?
1) $\angle C \cong \angle Y$
2) $\angle A \cong \angle X$
3) $\overline{AC} \cong \overline{YZ}$
4) $\overline{CB} \cong \overline{XZ}$

56 Triangle *JTM* is shown on the graph below.



Which transformation would result in an image that is *not* congruent to $\triangle JTM$?

1) $r_{y=x}$
2) $R_{90°}$
3) $T_{0,-3}$
4) D_2

57 Given three distinct quadrilaterals, a square, a rectangle, and a rhombus, which quadrilaterals must have perpendicular diagonals?

1) the rhombus, only
2) the rectangle and the square
3) the rhombus and the square
4) the rectangle, the rhombus, and the square

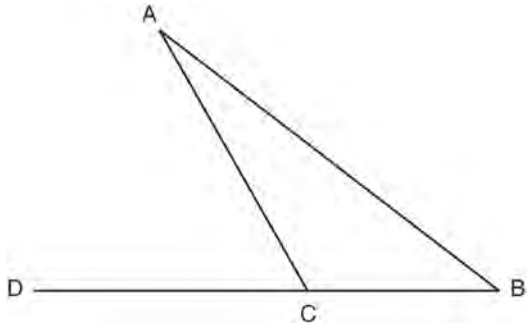
58 If $\overleftrightarrow{AB}$ is contained in plane $\mathcal{P}$, and $\overleftrightarrow{AB}$ is perpendicular to plane $\mathcal{R}$, which statement is true?

1) $\overleftrightarrow{AB}$ is parallel to plane $\mathcal{R}$.
2) Plane $\mathcal{P}$ is parallel to plane $\mathcal{R}$.
3) $\overleftrightarrow{AB}$ is perpendicular to plane $\mathcal{P}$.
4) Plane $\mathcal{P}$ is perpendicular to plane $\mathcal{R}$.

59 Which equation represents the perpendicular bisector of $\overline{AB}$ whose endpoints are $A(8,2)$ and $B(0,6)$?

1) $y = 2x - 4$
2) $y = -\frac{1}{2}x + 2$
3) $y = -\frac{1}{2}x + 6$
4) $y = 2x - 12$

60 In the diagram below of $\triangle ABC$, side $\overline{BC}$ is extended to point D, $m\angle A = x$, $m\angle B = 2x + 15$, and $m\angle ACD = 5x + 5$.



What is $m\angle B$?

1) 5
2) 20
3) 25
4) 55

61 Which compound statement is true?

1) A triangle has three sides and a quadrilateral has five sides.
2) A triangle has three sides if and only if a quadrilateral has five sides.
3) If a triangle has three sides, then a quadrilateral has five sides.
4) A triangle has three sides or a quadrilateral has five sides.

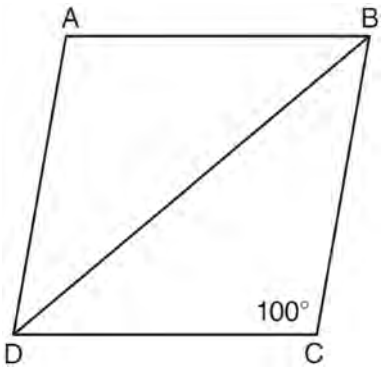
62 What is an equation of the circle with a radius of 5 and center at (1,–4)?

1) $(x+1)^2+(y-4)^2=5$
2) $(x-1)^2+(y+4)^2=5$
3) $(x+1)^2+(y-4)^2=25$
4) $(x-1)^2+(y+4)^2=25$

63 The image of $\triangle ABC$ after the transformation $r_{y-\text{axis}}$ is $\triangle A'B'C'$. Which property is *not* preserved?

1) distance
2) orientation
3) collinearity
4) angle measure

64 In the diagram below of rhombus *ABCD*, $m\angle C = 100$.



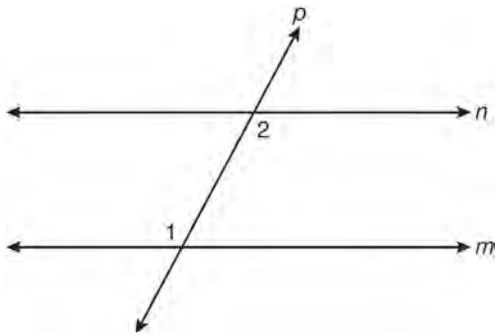
What is $m\angle DBC$?

1) 40
2) 45
3) 50
4) 80

65 What is the slope of a line that is perpendicular to the line whose equation is $3x + 5y = 4$?

1) $-\frac{3}{5}$
2) $\frac{3}{5}$
3) $-\frac{5}{3}$
4) $\frac{5}{3}$

66 In the diagram below, line *p* intersects line *m* and line *n*.



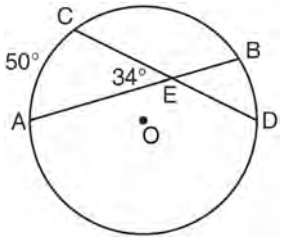
If $m\angle 1 = 7x$ and $m\angle 2 = 5x + 30$, lines *m* and *n* are parallel when *x* equals

1) 12.5
2) 15
3) 87.5
4) 105

67 Points *A*, *B*, *C*, and *D* are located on circle *O*, forming trapezoid *ABCD* with $\overline{AB} \parallel \overline{DC}$. Which statement must be true?

1) $\overline{AB} \cong \overline{DC}$
2) $\overset{\frown}{AD} \cong \overset{\frown}{BC}$
3) $\angle A \cong \angle D$
4) $\overset{\frown}{AB} \cong \overset{\frown}{DC}$

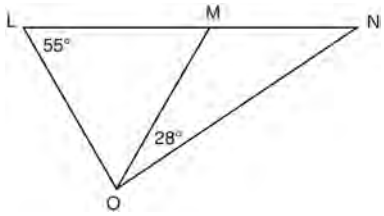
68 In the diagram below of circle O, chords $\overline{AB}$ and $\overline{CD}$ intersect at E.



If $m\angle AEC = 34$ and $m\overset{\frown}{AC} = 50$, what is $m\overset{\frown}{DB}$?

1) 16
2) 18
3) 68
4) 118

69 In the diagram below, $\triangle LMO$ is isosceles with $LO = MO$.



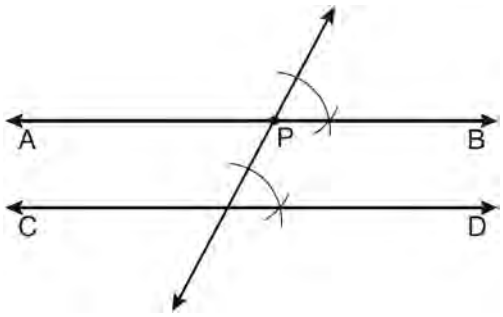
If $m\angle L = 55$ and $m\angle NOM = 28$, what is $m\angle N$?

1) 27
2) 28
3) 42
4) 70

70 How many points are both 4 units from the origin and also 2 units from the line $y = 4$?

1) 1
2) 2
3) 3
4) 4

71 The diagram below shows the construction of $\overleftrightarrow{AB}$ through point P parallel to $\overleftrightarrow{CD}$.



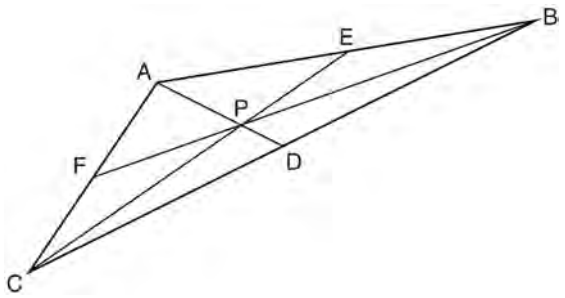
Which theorem justifies this method of construction?

1) If two lines in a plane are perpendicular to a transversal at different points, then the lines are parallel.
2) If two lines in a plane are cut by a transversal to form congruent corresponding angles, then the lines are parallel.
3) If two lines in a plane are cut by a transversal to form congruent alternate interior angles, then the lines are parallel.
4) If two lines in a plane are cut by a transversal to form congruent alternate exterior angles, then the lines are parallel.

72 Lines a and b intersect at point P. Line c passes through P and is perpendicular to the plane containing lines a and b. Which statement must be true?

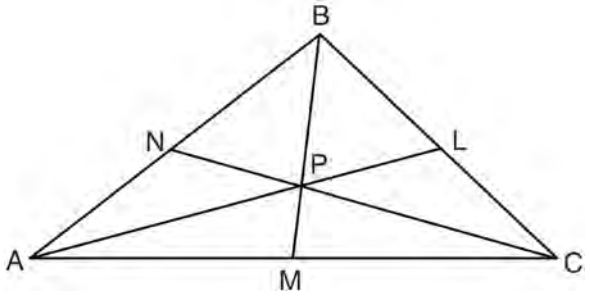
1) Lines a, b, and c are coplanar.
2) Line a is perpendicular to line b.
3) Line c is perpendicular to both line a and line b.
4) Line c is perpendicular to line a or line b, but not both.

73 In the diagram below of $\triangle ABC$, $\overline{AE} \cong \overline{BE}$, $\overline{AF} \cong \overline{CF}$, and $\overline{CD} \cong \overline{BD}$.



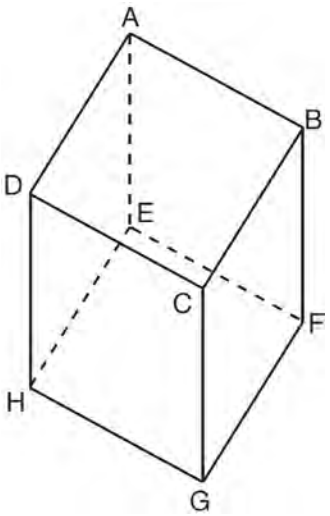
Point P must be the
1) centroid
2) circumcenter
3) Incenter
4) orthocenter

74 In the diagram below, point P is the centroid of $\triangle ABC$.



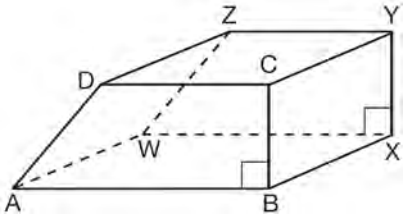
If $PM = 2x + 5$ and $BP = 7x + 4$, what is the length of $\overline{PM}$?
1) 9
2) 2
3) 18
4) 27

75 Which pair of edges is *not* coplanar in the cube shown below?



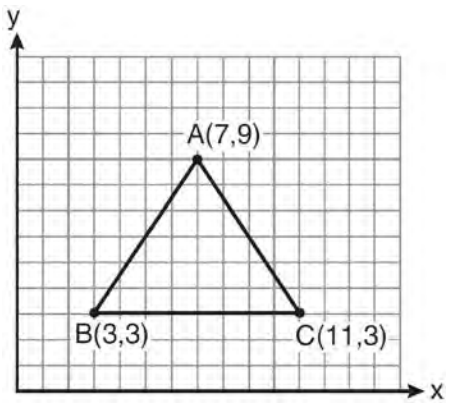
1) $\overline{EH}$ and $\overline{CD}$
2) $\overline{AD}$ and $\overline{FG}$
3) $\overline{DH}$ and $\overline{AE}$
4) $\overline{AB}$ and $\overline{EF}$

76 The bases of a prism are right trapezoids, as shown in the diagram below.



Which two edges do *not* lie in the same plane?
1) $\overline{BC}$ and $\overline{WZ}$
2) $\overline{AW}$ and $\overline{CY}$
3) $\overline{DC}$ and $\overline{WX}$
4) $\overline{BX}$ and $\overline{AB}$

77 The vertices of the triangle in the diagram below are $A(7,9)$, $B(3,3)$, and $C(11,3)$.



What are the coordinates of the centroid of $\triangle ABC$?

1) $(5,6)$
2) $(7,3)$
3) $(7,5)$
4) $(9,6)$

78 For which polygon does the sum of the measures of the interior angles equal the sum of the measures of the exterior angles?

1) hexagon
2) pentagon
3) quadrilateral
4) triangle

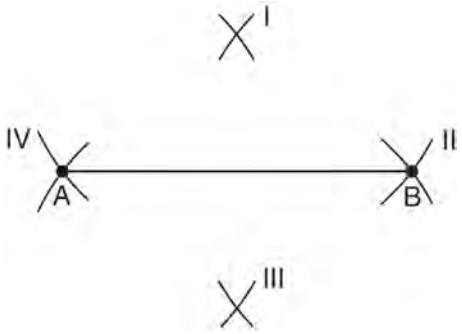
79 The coordinates of the endpoints of $\overline{AB}$ are $A(0,0)$ and $B(0,6)$. The equation of the perpendicular bisector of $\overline{AB}$ is

1) $x = 0$
2) $x = 3$
3) $y = 0$
4) $y = 3$

80 In quadrilateral *ABCD*, each diagonal bisects opposite angles. If $m\angle DAB = 70$, then *ABCD* must be a

1) rectangle
2) trapezoid
3) rhombus
4) square

81 Line segment *AB* is shown in the diagram below.



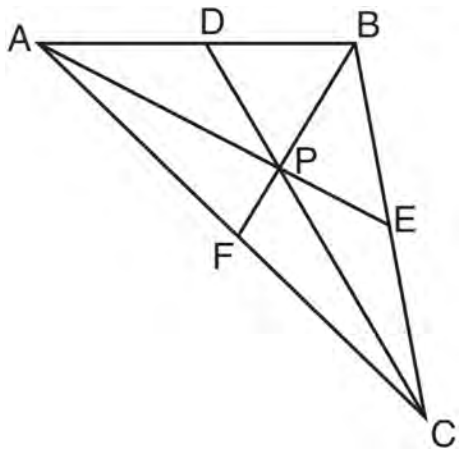
Which two sets of construction marks, labeled I, II, III, and IV, are part of the construction of the perpendicular bisector of line segment *AB*?

1) I and II
2) I and III
3) II and III
4) II and IV

82 A sphere is inscribed inside a cube with edges of 6 cm. In cubic centimeters, what is the volume of the sphere, in terms of π?

1) 12π
2) 36π
3) 48π
4) 288π

83 In $\triangle ABC$ shown below, P is the centroid and $BF = 18$.



What is the length of $\overline{BP}$?
1) 6
2) 9
3) 3
4) 12

84 Plane $\mathcal{R}$ is perpendicular to line k and plane $\mathcal{D}$ is perpendicular to line k. Which statement is correct?
1) Plane $\mathcal{R}$ is perpendicular to plane $\mathcal{D}$.
2) Plane $\mathcal{R}$ is parallel to plane $\mathcal{D}$.
3) Plane $\mathcal{R}$ intersects plane $\mathcal{D}$.
4) Plane $\mathcal{R}$ bisects plane $\mathcal{D}$.

85 A line segment has endpoints $A(7,-1)$ and $B(-3,3)$. What are the coordinates of the midpoint of $\overline{AB}$?
1) $(1,2)$
2) $(2,1)$
3) $(-5,2)$
4) $(5,-2)$

86 What is the equation of a circle whose center is 4 units above the origin in the coordinate plane and whose radius is 6?
1) $x^2 + (y-6)^2 = 16$
2) $(x-6)^2 + y^2 = 16$
3) $x^2 + (y-4)^2 = 36$
4) $(x-4)^2 + y^2 = 36$

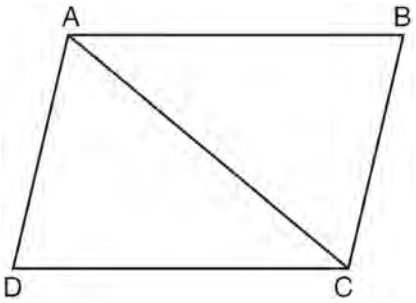
87 The two lines represented by the equations below are graphed on a coordinate plane.

$$x + 6y = 12$$

$$3(x-2) = -y - 4$$

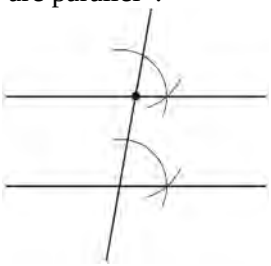
Which statement best describes the two lines?
1) The lines are parallel.
2) The lines are the same line.
3) The lines are perpendicular.
4) The lines intersect at an angle other than 90°.

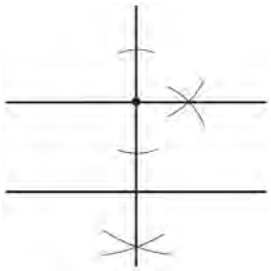
88 In the diagram of quadrilateral $ABCD$, $\overline{AB} \parallel \overline{CD}$, $\angle ABC \cong \angle CDA$, and diagonal $\overline{AC}$ is drawn.

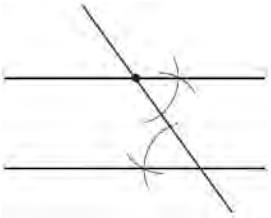


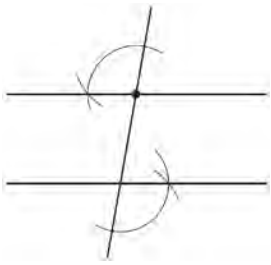
Which method can be used to prove $\triangle ABC$ is congruent to $\triangle CDA$?
1) AAS
2) SSA
3) SAS
4) SSS

89 Which construction of parallel lines is justified by the theorem "If two lines are cut by a transversal to form congruent alternate interior angles, then the lines are parallel"?

1) 

2) 

3) 

4) 

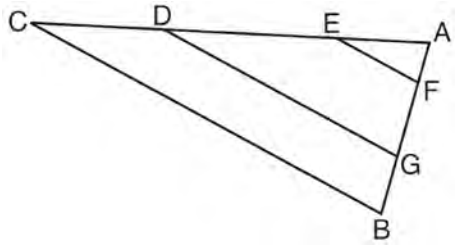
90 What is the image of the point $(2,-3)$ after the transformation $r_{y-\text{axis}}$?

1) $(2,3)$
2) $(-2,-3)$
3) $(-2,3)$
4) $(-3,2)$

91 The statement "$x > 5$ or $x < 3$" is *false* when x is equal to

1) 1
2) 2
3) 7
4) 4

92 In the diagram below of $\triangle ABC$, with $\overline{CDEA}$ and $\overline{BGFA}$, $\overline{EF} \parallel \overline{DG} \parallel \overline{CB}$.



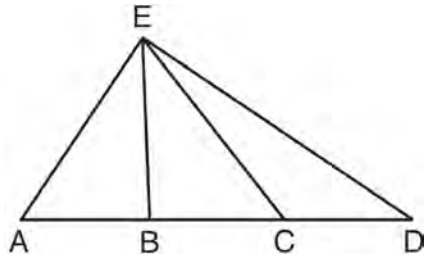
Which statement is *false*?

1) $\frac{AC}{AD} = \frac{AB}{AG}$
2) $\frac{AE}{AF} = \frac{AC}{AB}$
3) $\frac{AE}{AD} = \frac{EC}{AC}$
4) $\frac{BG}{BA} = \frac{CD}{CA}$

93 What is the equation of the line that passes through the point $(-9,6)$ and is perpendicular to the line $y = 3x - 5$?

1) $y = 3x + 21$
2) $y = -\frac{1}{3}x - 3$
3) $y = 3x + 33$
4) $y = -\frac{1}{3}x + 3$

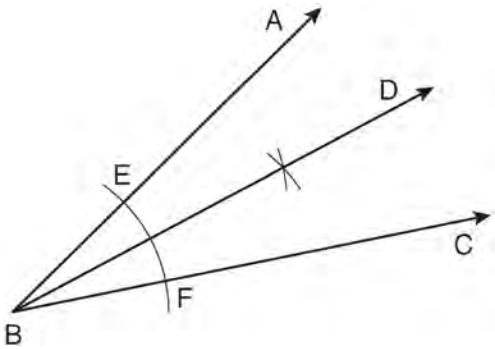
94 In $\triangle AED$ with $\overline{ABCD}$ shown in the diagram below, $\overline{EB}$ and $\overline{EC}$ are drawn.



If $\overline{AB} \cong \overline{CD}$, which statement could always be proven?

1) $\overline{AC} \cong \overline{DB}$
2) $\overline{AE} \cong \overline{ED}$
3) $\overline{AB} \cong \overline{BC}$
4) $\overline{EC} \cong \overline{EA}$

95 A straightedge and compass were used to create the construction below. Arc EF was drawn from point B, and arcs with equal radii were drawn from E and F.



Which statement is *false*?

1) $m\angle ABD = m\angle DBC$
2) $\frac{1}{2}(m\angle ABC) = m\angle ABD$
3) $2(m\angle DBC) = m\angle ABC$
4) $2(m\angle ABC) = m\angle CBD$

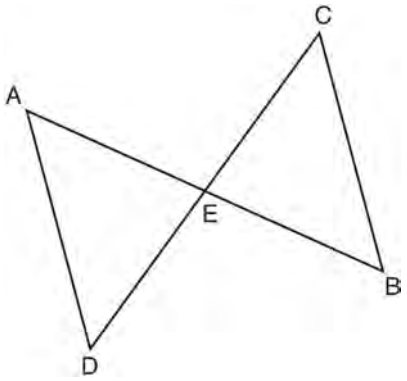
96 Point P lies on line m. Point P is also included in distinct planes $\mathcal{Q}$, $\mathcal{R}$, $\mathcal{S}$, and $\mathcal{T}$. At most, how many of these planes could be perpendicular to line m?

1) 1
2) 2
3) 3
4) 4

97 The equation of line k is $y = \frac{1}{3}x - 2$. The equation of line m is $-2x + 6y = 18$. Lines k and m are

1) parallel
2) perpendicular
3) the same line
4) neither parallel nor perpendicular

98 In the diagram below of $\triangle DAE$ and $\triangle BCE$, $\overline{AB}$ and $\overline{CD}$ intersect at E, such that $\overline{AE} \cong \overline{CE}$ and $\angle BCE \cong \angle DAE$.



Triangle DAE can be proved congruent to triangle BCE by

1) ASA
2) SAS
3) SSS
4) HL

99 When writing a geometric proof, which angle relationship could be used alone to justify that two angles are congruent?
1) supplementary angles
2) linear pair of angles
3) adjacent angles
4) vertical angles

100 What is an equation of the line that passes through the point $(-2,3)$ and is parallel to the line whose equation is $y = \frac{3}{2}x - 4$?
1) $y = \frac{-2}{3}x$
2) $y = \frac{-2}{3}x + \frac{5}{3}$
3) $y = \frac{3}{2}x$
4) $y = \frac{3}{2}x + 6$

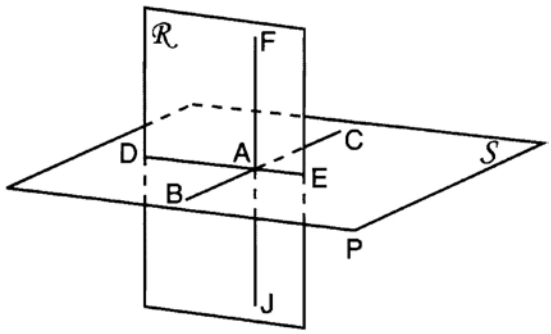
101 The coordinates of point A are $(-3a, 4b)$. If point A' is the image of point A reflected over the line $y = x$, the coordinates of A' are
1) $(4b, -3a)$
2) $(3a, 4b)$
3) $(-3a, -4b)$
4) $(-4b, -3a)$

102 Scalene triangle ABC is similar to triangle DEF. Which statement is *false*?
1) $AB:BC = DE:EF$
2) $AC:DF = BC:EF$
3) $\angle ACB \cong \angle DFE$
4) $\angle ABC \cong \angle EDF$

103 Which quadrilateral has diagonals that are always perpendicular bisectors of each other?
1) square
2) rectangle
3) trapezoid
4) parallelogram

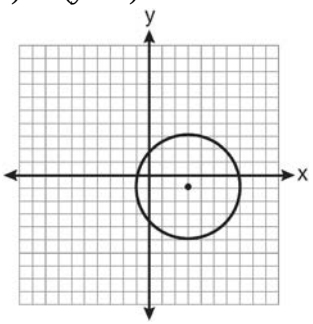
104 What is the length of the line segment whose endpoints are $(1,-4)$ and $(9,2)$?
1) 5
2) $2\sqrt{17}$
3) 10
4) $2\sqrt{26}$

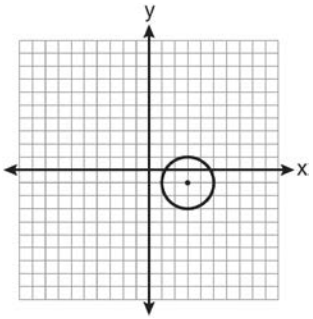
105 As shown in the diagram below, $\overline{FJ}$ is contained in plane $\mathcal{R}$, $\overline{BC}$ and $\overline{DE}$ are contained in plane $\mathcal{S}$, and $\overline{FJ}$, $\overline{BC}$, and $\overline{DE}$ intersect at A.

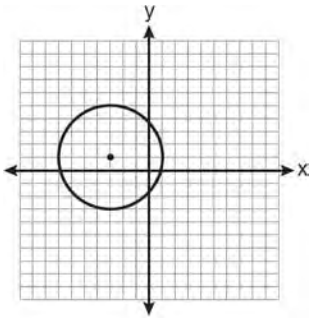


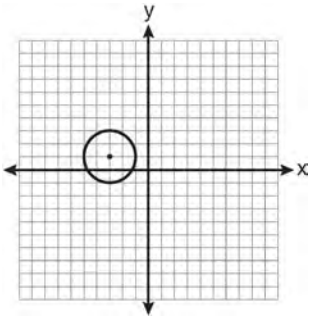
Which fact is sufficient to show that planes $\mathcal{R}$ and $\mathcal{S}$ are perpendicular?
1) $\overline{FA} \perp \overline{DE}$
2) $\overline{AD} \perp \overline{AF}$
3) $\overline{BC} \perp \overline{FJ}$
4) $\overline{DE} \perp \overline{BC}$

106 Which graph represents a circle with the equation $(x-3)^2+(y+1)^2=4$?

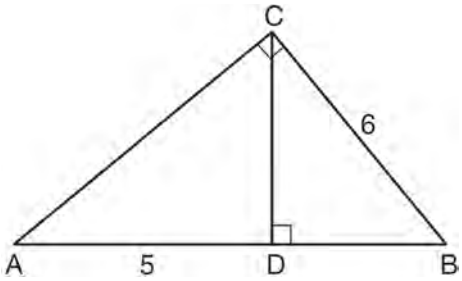
1) 

2) 

3) 

4) 

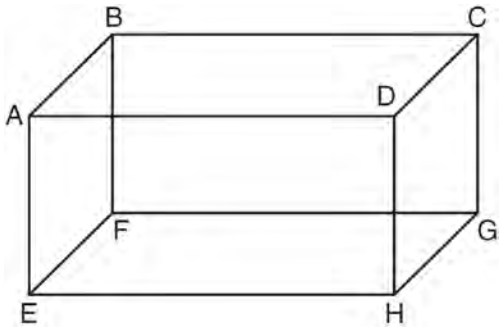
107 In the diagram below of right triangle ABC, $\overline{CD}$ is the altitude to hypotenuse $\overline{AB}$, $CB = 6$, and $AD = 5$.



What is the length of $\overline{BD}$?

1) 5
2) 9
3) 3
4) 4

108 The diagram below shows a rectangular prism.



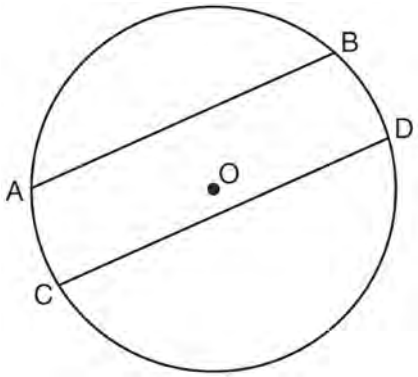
Which pair of edges are segments of lines that are coplanar?

1) $\overline{AB}$ and $\overline{DH}$
2) $\overline{AE}$ and $\overline{DC}$
3) $\overline{BC}$ and $\overline{EH}$
4) $\overline{CG}$ and $\overline{EF}$

109 If two distinct planes, $\mathcal{A}$ and $\mathcal{B}$, are perpendicular to line c, then which statement is true?

1) Planes $\mathcal{A}$ and $\mathcal{B}$ are parallel to each other.
2) Planes $\mathcal{A}$ and $\mathcal{B}$ are perpendicular to each other.
3) The intersection of planes $\mathcal{A}$ and $\mathcal{B}$ is a line parallel to line c.
4) The intersection of planes $\mathcal{A}$ and $\mathcal{B}$ is a line perpendicular to line c.

110 In the diagram below of circle O, chord $\overline{AB}$ is parallel to chord $\overline{CD}$.



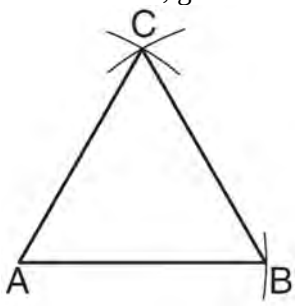
Which statement must be true?

1) $\overset{\frown}{AC} \cong \overset{\frown}{BD}$
2) $\overset{\frown}{AB} \cong \overset{\frown}{CD}$
3) $\overline{AB} \cong \overline{CD}$
4) $\overset{\frown}{ABD} \cong \overset{\frown}{CDB}$

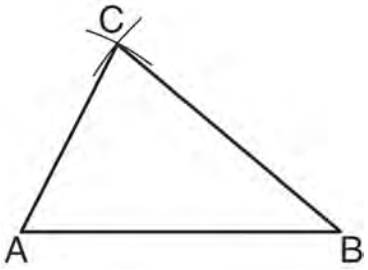
111 A line segment has endpoints $(4,7)$ and $(1,11)$. What is the length of the segment?

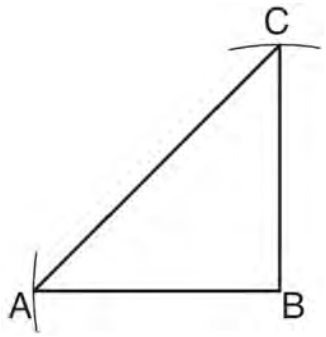
1) 5
2) 7
3) 16
4) 25

112 Which diagram represents a correct construction of equilateral $\triangle ABC$, given side $\overline{AB}$?

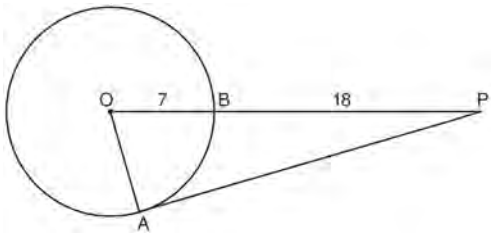
1)


2)


3)


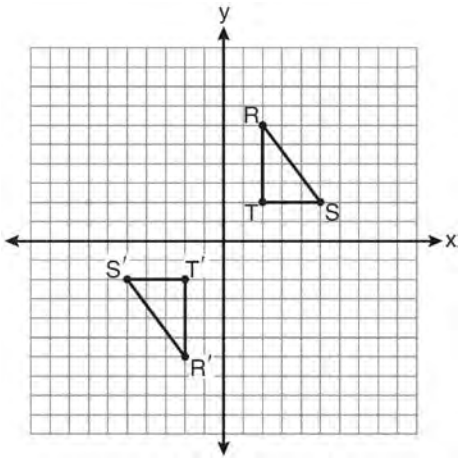
4)


113 In the diagram below of $\triangle PAO$, $\overline{AP}$ is tangent to circle O at point A, $OB = 7$, and $BP = 18$.



What is the length of $\overline{AP}$?
1) 10
2) 12
3) 17
4) 24

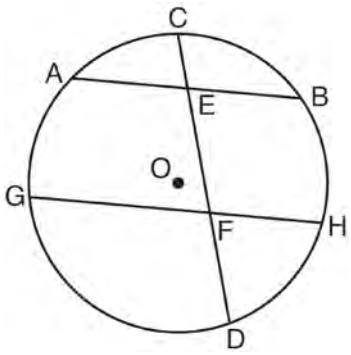
114 As shown on the graph below, $\triangle R'S'T'$ is the image of $\triangle RST$ under a single transformation.



Which transformation does this graph represent?
1) glide reflection
2) line reflection
3) rotation
4) translation

115 Point M is the midpoint of $\overline{AB}$. If the coordinates of A are $(-3,6)$ and the coordinates of M are $(-5,2)$, what are the coordinates of B?
1) $(1,2)$
2) $(7,10)$
3) $(-4,4)$
4) $(-7,-2)$

116 In the diagram below of circle O, chord $\overline{AB}$ is parallel to chord $\overline{GH}$. Chord $\overline{CD}$ intersects $\overline{AB}$ at E and $\overline{GH}$ at F.



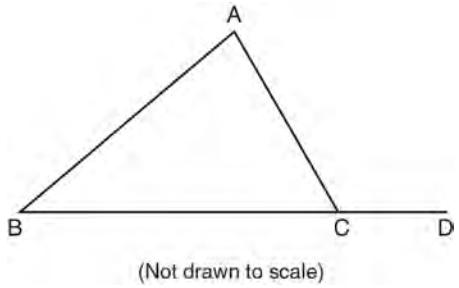
Which statement must always be true?
1) $\overset{\frown}{AC} \cong \overset{\frown}{CB}$
2) $\overset{\frown}{DH} \cong \overset{\frown}{BH}$
3) $\overset{\frown}{AB} \cong \overset{\frown}{GH}$
4) $\overset{\frown}{AG} \cong \overset{\frown}{BH}$

117 If two sides of a triangle have lengths of 4 and 10, the third side could be
1) 8
2) 2
3) 16
4) 4

118 Which equation represents circle O with center $(2,-8)$ and radius 9?

1) $(x+2)^2+(y-8)^2=9$
2) $(x-2)^2+(y+8)^2=9$
3) $(x+2)^2+(y-8)^2=81$
4) $(x-2)^2+(y+8)^2=81$

119 In the diagram below of $\triangle ABC$, $\overline{BC}$ is extended to D.



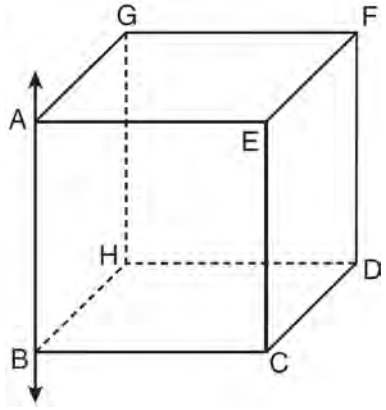
If $m\angle A = x^2 - 6x$, $m\angle B = 2x - 3$, and $m\angle ACD = 9x + 27$, what is the value of x?

1) 10
2) 2
3) 3
4) 15

120 The statement "x is a multiple of 3, and x is an even integer" is true when x is equal to

1) 9
2) 8
3) 3
4) 6

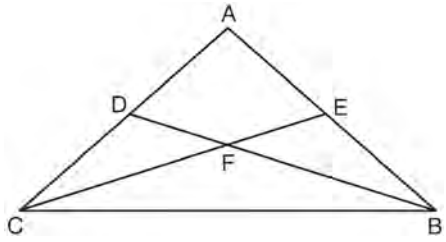
121 In the diagram below, $\overleftrightarrow{AB}$ is perpendicular to plane $AEFG$.



Which plane must be perpendicular to plane $AEFG$?

1) $ABCE$
2) $BCDH$
3) $CDFE$
4) $HDFG$

122 In $\triangle ABC$ shown below with $\overline{ADC}$, $\overline{AEB}$, $\overline{CFE}$, and $\overline{BFD}$, $\triangle ACE \cong \triangle ABD$.



Which statement must be true?

1) $\angle ACF \cong \angle BCF$
2) $\angle DAE \cong \angle DFE$
3) $\angle BCD \cong \angle ABD$
4) $\angle AEF \cong \angle ADF$

123 The equations of lines *k*, *m*, and *n* are given below.

$k: 3y + 6 = 2x$

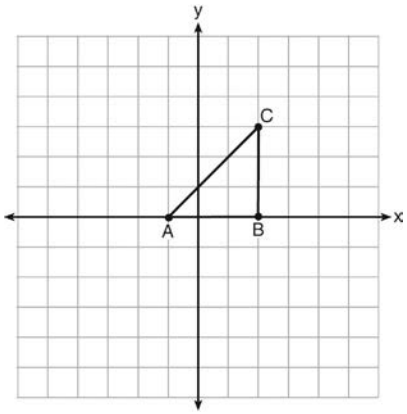
$m: 3y + 2x + 6 = 0$

$n: 2y = 3x + 6$

Which statement is true?

1) $k \parallel m$
2) $n \parallel m$
3) $m \perp k$
4) $m \perp n$

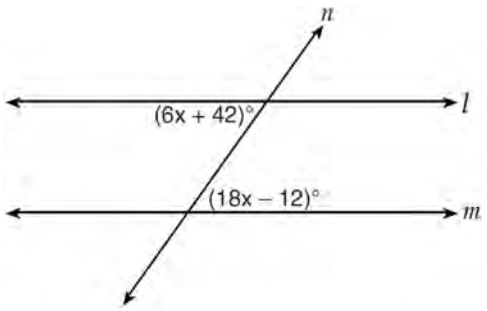
124 Triangle *ABC* is graphed on the set of axes below.



Which transformation produces an image that is similar to, but *not* congruent to, $\triangle ABC$?

1) $T_{2,3}$
2) D_2
3) $r_{y=x}$
4) R_{90}

125 Line *n* intersects lines *l* and *m*, forming the angles shown in the diagram below.



Which value of *x* would prove $l \parallel m$?

1) 2.5
2) 4.5
3) 6.25
4) 8.75

126 What is the length of $\overline{AB}$ with endpoints $A(-1, 0)$ and $B(4, -3)$?

1) $\sqrt{6}$
2) $\sqrt{18}$
3) $\sqrt{34}$
4) $\sqrt{50}$

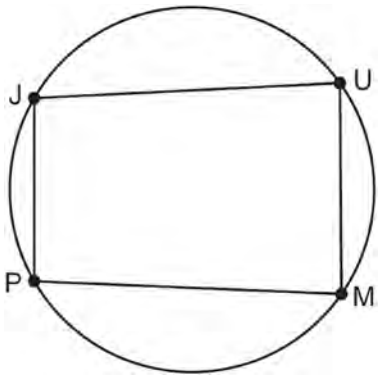
127 In rhombus *ABCD*, the diagonals $\overline{AC}$ and $\overline{BD}$ intersect at *E*. If $AE = 5$ and $BE = 12$, what is the length of $\overline{AB}$?

1) 7
2) 10
3) 13
4) 17

128 Lines *m* and *n* intersect at point *A*. Line *k* is perpendicular to both lines *m* and *n* at point *A*. Which statement *must* be true?

1) Lines *m*, *n*, and *k* are in the same plane.
2) Lines *m* and *n* are in two different planes.
3) Lines *m* and *n* are perpendicular to each other.
4) Line *k* is perpendicular to the plane containing lines *m* and *n*.

129 In the diagram below, quadrilateral *JUMP* is inscribed in a circle..



Opposite angles *J* and *M* must be

1) right
2) complementary
3) congruent
4) supplementary

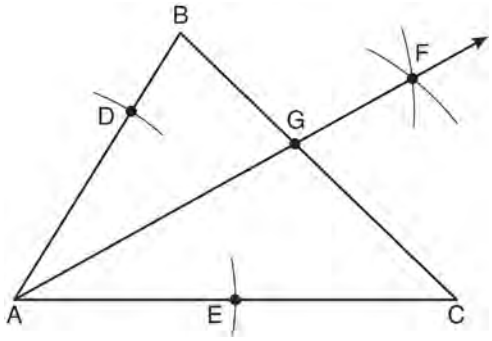
130 In $\triangle ABC$, $AB = 5$ feet and $BC = 3$ feet. Which inequality represents all possible values for the length of $\overline{AC}$, in feet?

1) $2 \le AC \le 8$
2) $2 < AC < 8$
3) $3 \le AC \le 7$
4) $3 < AC < 7$

131 Pentagon *PQRST* has $\overline{PQ}$ parallel to $\overline{TS}$. After a translation of $T_{2,-5}$, which line segment is parallel to $\overline{P'Q'}$?

1) $\overline{R'Q'}$
2) $\overline{R'S'}$
3) $\overline{T'S'}$
4) $\overline{T'P'}$

132 As shown in the diagram below of $\triangle ABC$, a compass is used to find points *D* and *E*, equidistant from point *A*. Next, the compass is used to find point *F*, equidistant from points *D* and *E*. Finally, a straightedge is used to draw $\overrightarrow{AF}$. Then, point *G*, the intersection of $\overrightarrow{AF}$ and side $\overline{BC}$ of $\triangle ABC$, is labeled.



Which statement must be true?

1) $\overrightarrow{AF}$ bisects side $\overline{BC}$
2) $\overrightarrow{AF}$ bisects $\angle BAC$
3) $\overrightarrow{AF} \perp \overline{BC}$
4) $\triangle ABG \sim \triangle ACG$

133 In the diagram below of $\overline{ABCD}$, $\overline{AC} \cong \overline{BD}$.

Using this information, it could be proven that
1) $BC = AB$
2) $AB = CD$
3) $AD - BC = CD$
4) $AB + CD = AD$

134 Point A lies in plane $\mathcal{B}$. How many lines can be drawn perpendicular to plane $\mathcal{B}$ through point A?
1) one
2) two
3) zero
4) infinite

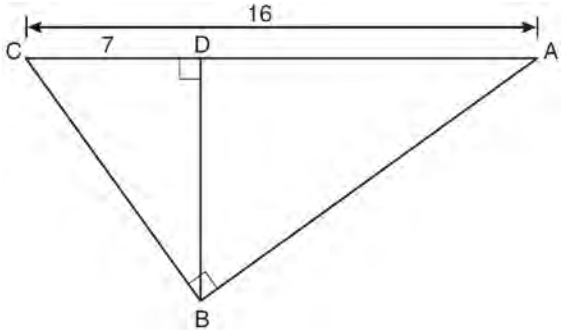
135 In $\triangle ABC$, $AB = 4$, $BC = 7$, and $AC = 10$. Which statement is true?
1) $m\angle B > m\angle C > m\angle A$
2) $m\angle B > m\angle A > m\angle C$
3) $m\angle C > m\angle B > m\angle A$
4) $m\angle C > m\angle A > m\angle B$

136 Which type of triangle can be drawn using the points $(-2,3)$, $(-2,-7)$, and $(4,-5)$?
1) scalene
2) isosceles
3) equilateral
4) no triangle can be drawn

137 What is the volume, in cubic centimeters, of a cylinder that has a height of 15 cm and a diameter of 12 cm?
1) 180π
2) 540π
3) 675π
4) $2,160\pi$

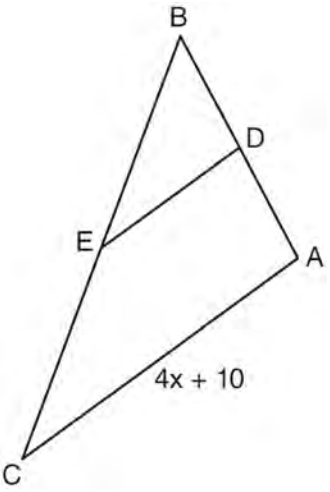
138 Triangle ABC has vertices $A(0,0)$, $B(3,2)$, and $C(0,4)$. The triangle may be classified as
1) equilateral
2) isosceles
3) right
4) scalene

139 In the diagram below of right triangle ABC, altitude $\overline{BD}$ is drawn to hypotenuse $\overline{AC}$, $AC = 16$, and $CD = 7$.



What is the length of $\overline{BD}$?
1) $3\sqrt{7}$
2) $4\sqrt{7}$
3) $7\sqrt{3}$
4) 12

140 In the diagram below of $\triangle ABC$, D is the midpoint of $\overline{AB}$, and E is the midpoint of $\overline{BC}$.



If $AC = 4x + 10$, which expression represents DE?
1) $x + 2.5$
2) $2x + 5$
3) $2x + 10$
4) $8x + 20$

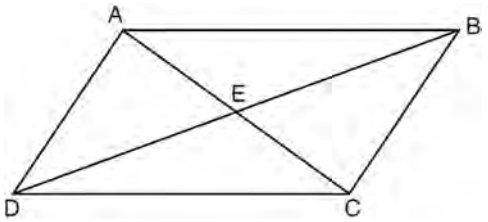
141 In all isosceles triangles, the exterior angle of a base angle must always be
1) a right angle
2) an acute angle
3) an obtuse angle
4) equal to the vertex angle

142 The diagonals of a quadrilateral are congruent but do not bisect each other. This quadrilateral is
1) an isosceles trapezoid
2) a parallelogram
3) a rectangle
4) a rhombus

143 What is an equation of the line that is perpendicular to the line whose equation is $y = \frac{3}{5}x - 2$ and that passes through the point $(3, -6)$?
1) $y = \frac{5}{3}x - 11$
2) $y = -\frac{5}{3}x + 11$
3) $y = -\frac{5}{3}x - 1$
4) $y = \frac{5}{3}x + 1$

144 A circle has the equation $(x-2)^2 + (y+3)^2 = 36$. What are the coordinates of its center and the length of its radius?
1) $(-2, 3)$ and 6
2) $(2, -3)$ and 6
3) $(-2, 3)$ and 36
4) $(2, -3)$ and 36

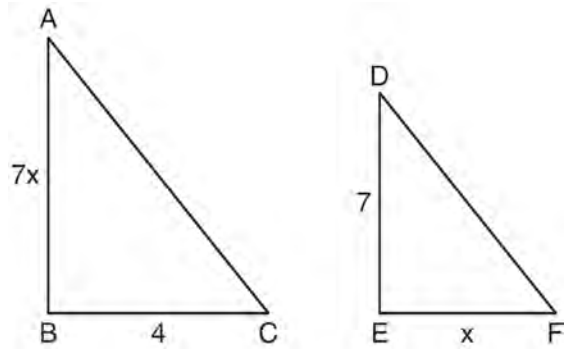
145 In parallelogram $ABCD$ shown below, diagonals $\overline{AC}$ and $\overline{BD}$ intersect at E.



Which statement must be true?
1) $\overline{AC} \cong \overline{DB}$
2) $\angle ABD \cong \angle CBD$
3) $\triangle AED \cong \triangle CEB$
4) $\triangle DCE \cong \triangle BCE$

146 Plane $\mathcal{A}$ is parallel to plane $\mathcal{B}$. Plane C intersects plane $\mathcal{A}$ in line *m* and intersects plane $\mathcal{B}$ in line *n*. Lines *m* and *n* are
1) intersecting
2) parallel
3) perpendicular
4) skew

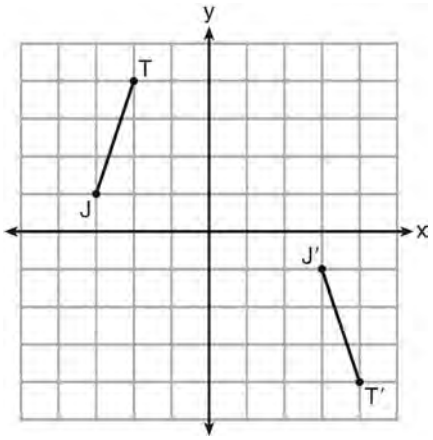
147 As shown in the diagram below, $\triangle ABC \sim \triangle DEF$, $AB = 7x$, $BC = 4$, $DE = 7$, and $EF = x$.



What is the length of $\overline{AB}$?
1) 28
2) 2
3) 14
4) 4

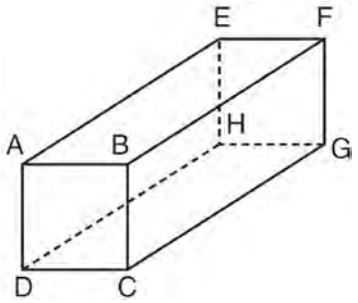
148 Quadrilateral *ABCD* undergoes a transformation, producing quadrilateral $A'B'C'D'$. For which transformation would the area of $A'B'C'D'$ *not* be equal to the area of *ABCD*?
1) a rotation of 90° about the origin
2) a reflection over the *y*-axis
3) a dilation by a scale factor of 2
4) a translation defined by $(x,y) \rightarrow (x+4, y-1)$

149 The graph below shows $\overline{JT}$ and its image, $\overline{J'T'}$, after a transformation.



Which transformation would map $\overline{JT}$ onto $\overline{J'T'}$?
1) translation
2) glide reflection
3) rotation centered at the origin
4) reflection through the origin

150 The diagram below represents a rectangular solid.

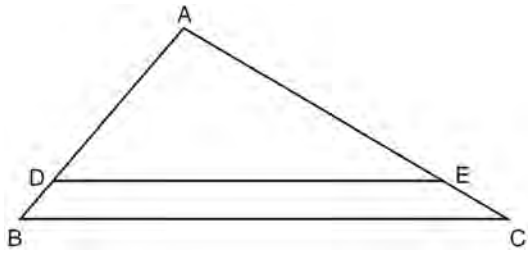


Which statement must be true?
1) $\overline{EH}$ and $\overline{BC}$ are coplanar
2) $\overline{FG}$ and $\overline{AB}$ are coplanar
3) $\overline{EH}$ and $\overline{AD}$ are skew
4) $\overline{FG}$ and $\overline{CG}$ are skew

151 Which quadrilateral has diagonals that always bisect its angles and also bisect each other?
1) rhombus
2) rectangle
3) parallelogram
4) isosceles trapezoid

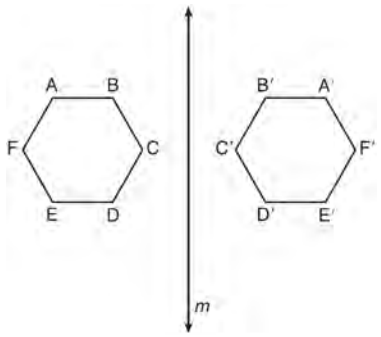
152 The slope of line ℓ is $-\frac{1}{3}$. What is an equation of a line that is perpendicular to line ℓ?
1) $y + 2 = \frac{1}{3}x$
2) $-2x + 6 = 6y$
3) $9x - 3y = 27$
4) $3x + y = 0$

153 In the diagram of $\triangle ABC$ shown below, $\overline{DE} \parallel \overline{BC}$.



If $AB = 10$, $AD = 8$, and $AE = 12$, what is the length of $\overline{EC}$?
1) 6
2) 2
3) 3
4) 15

154 As shown in the diagram below, when hexagon *ABCDEF* is reflected over line *m*, the image is hexagon *A'B'C'D'E'F'*.



Under this transformation, which property is *not* preserved?
1) area
2) distance
3) orientation
4) angle measure

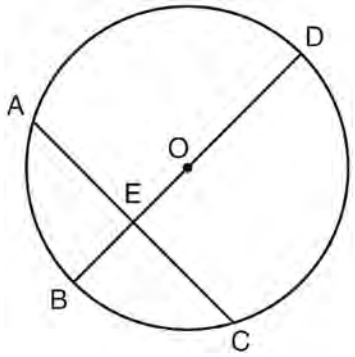
155 Triangle $A'B'C'$ is the image of $\triangle ABC$ after a dilation of 2. Which statement is true?
1) $AB = A'B'$
2) $BC = 2(B'C')$
3) $m\angle B = m\angle B'$
4) $m\angle A = \frac{1}{2}(m\angle A')$

156 The lines represented by the equations $4x + 6y = 6$ and $y = \frac{2}{3}x - 1$ are
1) parallel
2) the same line
3) perpendicular
4) intersecting, but *not* perpendicular

157 The sum of the interior angles of a polygon of n sides is

1) 360
2) $\frac{360}{n}$
3) $(n-2)\cdot 180$
4) $\frac{(n-2)\cdot 180}{n}$

158 In circle O shown below, diameter $\overline{DB}$ is perpendicular to chord $\overline{AC}$ at E.



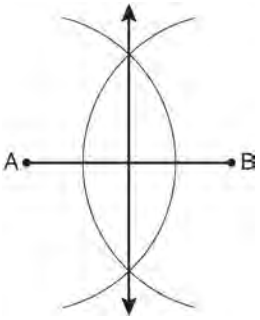
If $DB = 34$, $AC = 30$, and $DE > BE$, what is the length of $\overline{BE}$?

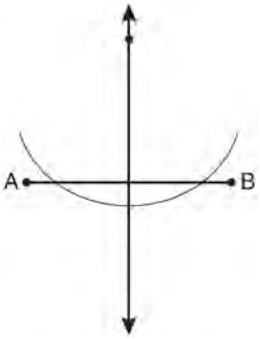
1) 8
2) 9
3) 16
4) 25

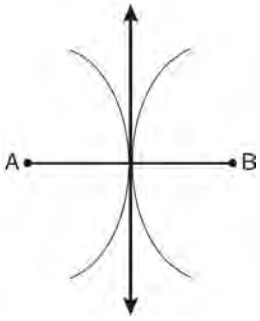
159 Triangle PQR has angles in the ratio of $2:3:5$. Which type of triangle is $\triangle PQR$?

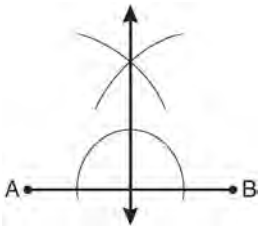
1) acute
2) isosceles
3) obtuse
4) right

160 Which diagram shows the construction of the perpendicular bisector of $\overline{AB}$?

1)


2)


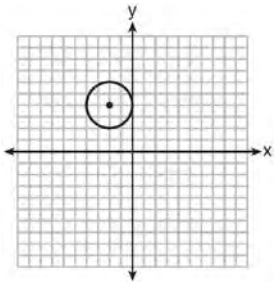
3)


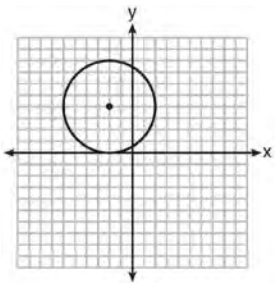
4)


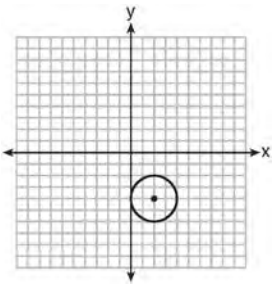
161 Which line is parallel to the line whose equation is $4x + 3y = 7$ and also passes through the point $(-5, 2)$?

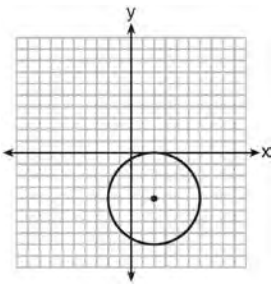
1) $4x + 3y = -26$
2) $4x + 3y = -14$
3) $3x + 4y = -7$
4) $3x + 4y = 14$

162 Which graph represents a circle whose equation is $(x-2)^2 + (y+4)^2 = 4$?

1) 

2) 

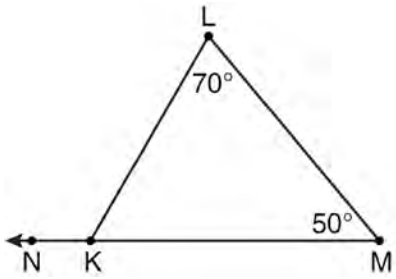
3) 

4) 

163 In a given triangle, the point of intersection of the three medians is the same as the point of intersection of the three altitudes. Which classification of the triangle is correct?

1) scalene triangle
2) isosceles triangle
3) equilateral triangle
4) right isosceles triangle

164 In the diagram of $\triangle KLM$ below, $m\angle L = 70$, $m\angle M = 50$, and $\overline{MK}$ is extended through N.



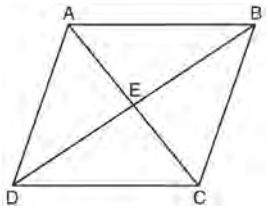
What is the measure of $\angle LKN$?

1) 60°
2) 120°
3) 180°
4) 300°

165 What is the measure of each interior angle of a regular hexagon?

1) 60°
2) 120°
3) 135°
4) 270°

166 Parallelogram $ABCD$ with diagonals $\overline{AC}$ and $\overline{BD}$ intersecting at E is shown below.



Which statement must be true?

1) $\overline{BE} \cong \overline{CE}$
2) $\angle BAE \cong \angle DCE$
3) $\overline{AB} \cong \overline{BC}$
4) $\angle DAE \cong \angle CBE$

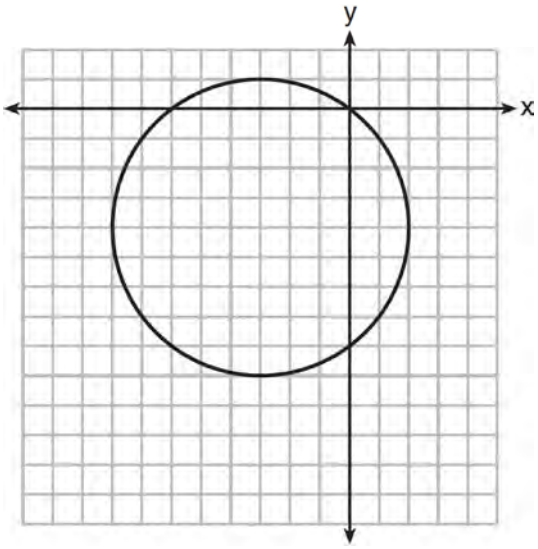
167 Which equation of a circle will have a graph that lies entirely in the first quadrant?

1) $(x-4)^2+(y-5)^2=9$
2) $(x+4)^2+(y+5)^2=9$
3) $(x+4)^2+(y+5)^2=25$
4) $(x-5)^2+(y-4)^2=25$

168 What is the length of the line segment whose endpoints are $A(-1,9)$ and $B(7,4)$?

1) $\sqrt{61}$
2) $\sqrt{89}$
3) $\sqrt{205}$
4) $\sqrt{233}$

169 What is an equation of the circle shown in the graph below?

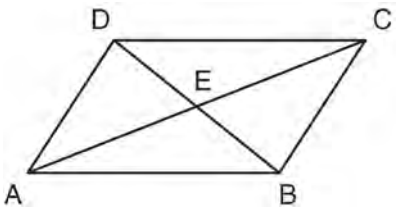


1) $(x-3)^2+(y-4)^2=25$
2) $(x+3)^2+(y+4)^2=25$
3) $(x-3)^2+(y-4)^2=10$
4) $(x+3)^2+(y+4)^2=10$

170 An equation of the line that passes through $(2,-1)$ and is parallel to the line $2y+3x=8$ is

1) $y=\frac{3}{2}x-4$
2) $y=\frac{3}{2}x+4$
3) $y=-\frac{3}{2}x-2$
4) $y=-\frac{3}{2}x+2$

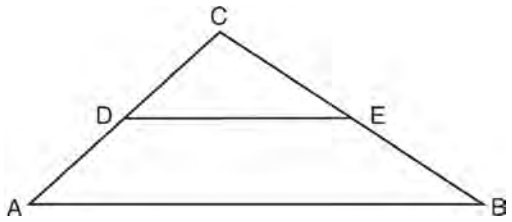
171 In the diagram below, parallelogram *ABCD* has diagonals $\overline{AC}$ and $\overline{BD}$ that intersect at point *E*.



Which expression is *not* always true?

1) $\angle DAE \cong \angle BCE$
2) $\angle DEC \cong \angle BEA$
3) $\overline{AC} \cong \overline{DB}$
4) $\overline{DE} \cong \overline{EB}$

172 In the diagram below, $\overline{DE}$ joins the midpoints of two sides of $\triangle ABC$.



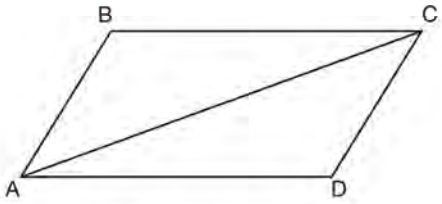
Which statement is *not* true?

1) $CE = \frac{1}{2} CB$
2) $DE = \frac{1}{2} AB$
3) area of $\triangle CDE = \frac{1}{2}$ area of $\triangle CAB$
4) perimeter of $\triangle CDE = \frac{1}{2}$ perimeter of $\triangle CAB$

173 The number of degrees in the sum of the interior angles of a pentagon is

1) 72
2) 360
3) 540
4) 720

174 Given that *ABCD* is a parallelogram, a student wrote the proof below to show that a pair of its opposite angles are congruent.



Statement	Reason
1. ABCD is a parallelogram.	1. Given
2. $\overline{BC} \cong \overline{AD}$ $\overline{AB} \cong \overline{DC}$	2. Opposite sides of a parallelogram are congruent.
3. $\overline{AC} \cong \overline{CA}$	3. Reflexive Postulate of Congruency
4. $\triangle ABC \cong \triangle CDA$	4. Side-Side-Side
5. $\angle B \cong \angle D$	5. _____

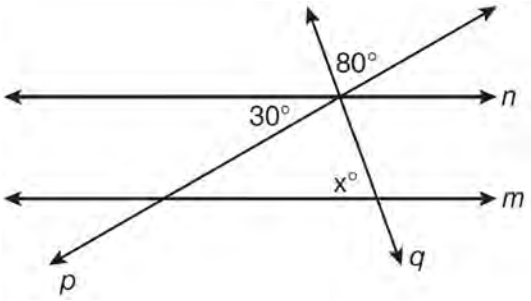
What is the reason justifying that $\angle B \cong \angle D$?

1) Opposite angles in a quadrilateral are congruent.
2) Parallel lines have congruent corresponding angles.
3) Corresponding parts of congruent triangles are congruent.
4) Alternate interior angles in congruent triangles are congruent.

175 The point $(3,-2)$ is rotated 90º about the origin and then dilated by a scale factor of 4. What are the coordinates of the resulting image?

1) $(-12,8)$
2) (12,-8)
3) $(8,12)$
4) $(-8,-12)$

176 In the diagram below, lines *n* and *m* are cut by transversals *p* and *q*.



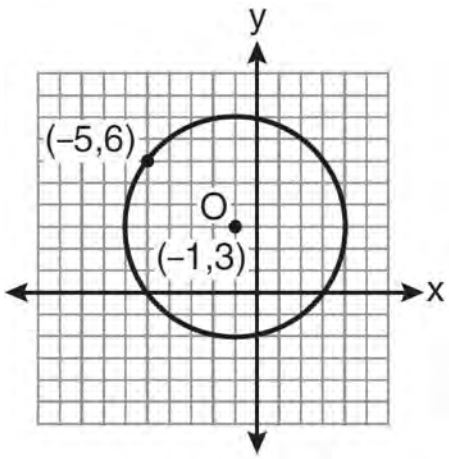
What value of *x* would make lines *n* and *m* parallel?

1) 110
2) 80
3) 70
4) 50

177 The equation of a circle with its center at $(-3,5)$ and a radius of 4 is

1) $(x+3)^2+(y-5)^2=4$
2) $(x-3)^2+(y+5)^2=4$
3) $(x+3)^2+(y-5)^2=16$
4) $(x-3)^2+(y+5)^2=16$

178 What is an equation of circle *O* shown in the graph below?

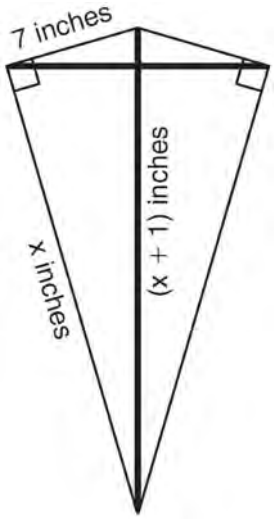


1) $(x+1)^2+(y-3)^2=25$
2) $(x-1)^2+(y+3)^2=25$
3) $(x-5)^2+(y+6)^2=25$
4) $(x+5)^2+(y-6)^2=25$

179 Which equation represents the line parallel to the line whose equation is $4x+2y=14$ and passing through the point $(2,2)$?

1) $y=-2x$
2) $y=-2x+6$
3) $y=\frac{1}{2}x$
4) $y=\frac{1}{2}x+1$

180 As shown in the diagram below, a kite needs a vertical and a horizontal support bar attached at opposite corners. The upper edges of the kite are 7 inches, the side edges are x inches, and the vertical support bar is $(x+1)$ inches.



What is the measure, in inches, of the vertical support bar?

1) 23
2) 24
3) 25
4) 26

181 What is an equation of a circle with center $(7,-3)$ and radius 4?

1) $(x-7)^2+(y+3)^2=4$
2) $(x+7)^2+(y-3)^2=4$
3) $(x-7)^2+(y+3)^2=16$
4) $(x+7)^2+(y-3)^2=16$

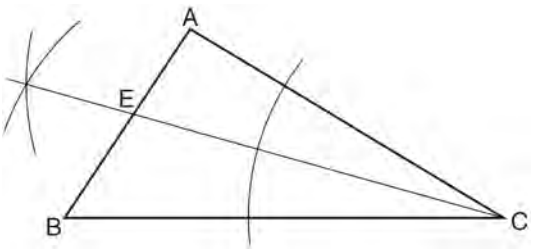
182 Quadrilateral $MNOP$ is a trapezoid with $\overline{MN} \parallel \overline{OP}$. If $M'N'O'P'$ is the image of $MNOP$ after a reflection over the x-axis, which two sides of quadrilateral $M'N'O'P'$ are parallel?

1) $\overline{M'N'}$ and $\overline{O'P'}$
2) $\overline{M'N'}$ and $\overline{N'O'}$
3) $\overline{P'M'}$ and $\overline{O'P'}$
4) $\overline{P'M'}$ and $\overline{N'O'}$

183 The vertices of parallelogram $ABCD$ are $A(2,0)$, $B(0,-3)$, $C(3,-3)$, and $D(5,0)$. If $ABCD$ is reflected over the x-axis, how many vertices remain invariant?

1) 1
2) 2
3) 3
4) 0

184 A student used a compass and a straightedge to construct $\overline{CE}$ in $\triangle ABC$ as shown below.



Which statement must always be true for this construction?

1) $\angle CEA \cong \angle CEB$
2) $\angle ACE \cong \angle BCE$
3) $\overline{AE} \cong \overline{BE}$
4) $\overline{EC} \cong \overline{AC}$

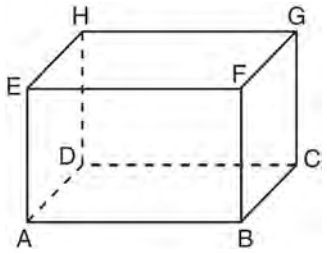
185 If $\triangle JKL \cong \triangle MNO$, which statement is always true?

1) $\angle KLJ \cong \angle NMO$
2) $\angle KJL \cong \angle MON$
3) $\overline{JL} \cong \overline{MO}$
4) $\overline{JK} \cong \overline{ON}$

186 Which set of numbers does *not* represent the sides of a right triangle?

1) $\{6, 8, 10\}$
2) $\{8, 15, 17\}$
3) $\{8, 24, 25\}$
4) $\{15, 36, 39\}$

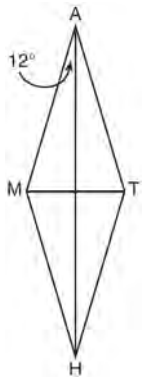
187 A right rectangular prism is shown in the diagram below.



Which line segments are coplanar?

1) $\overline{EF}$ and $\overline{BC}$
2) $\overline{HD}$ and $\overline{FG}$
3) $\overline{GH}$ and $\overline{FB}$
4) $\overline{EA}$ and $\overline{GC}$

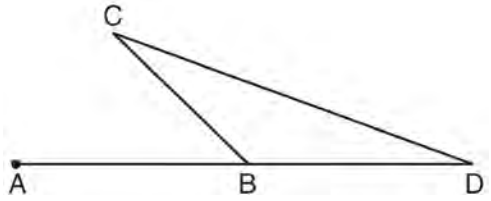
188 In the diagram below, *MATH* is a rhombus with diagonals $\overline{AH}$ and $\overline{MT}$.



If $m\angle HAM = 12$, what is $m\angle AMT$?

1) 12
2) 78
3) 84
4) 156

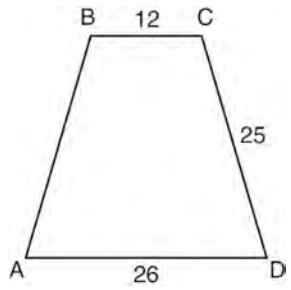
189 In the diagram below of $\triangle BCD$, side $\overline{DB}$ is extended to point *A*.



Which statement must be true?

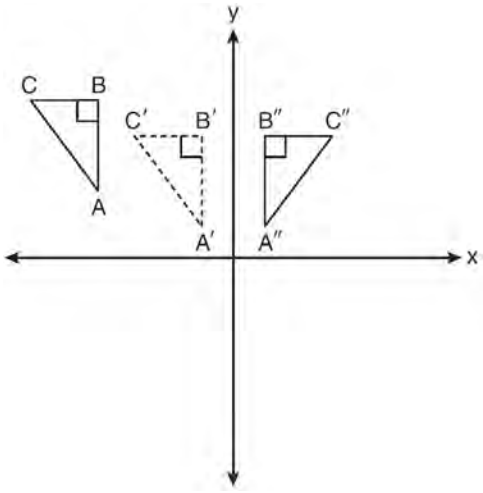
1) $m\angle C > m\angle D$
2) $m\angle ABC < m\angle D$
3) $m\angle ABC > m\angle C$
4) $m\angle ABC > m\angle C + m\angle D$

190 In the diagram below of isosceles trapezoid $ABCD$, $AB = CD = 25$, $AD = 26$, and $BC = 12$.



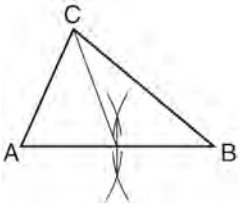
What is the length of an altitude of the trapezoid?
1) 7
2) 14
3) 19
4) 24

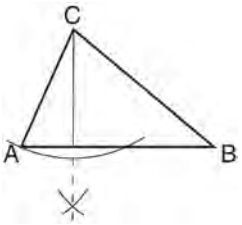
191 In the diagram below, $\triangle A'B'C'$ is a transformation of $\triangle ABC$, and $\triangle A''B''C''$ is a transformation of $\triangle A'B'C'$.

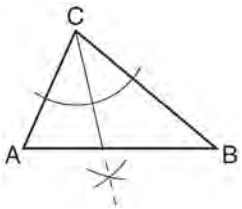


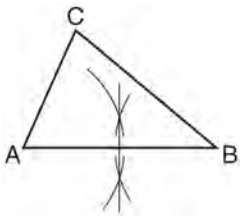
The composite transformation of $\triangle ABC$ to $\triangle A''B''C''$ is an example of a
1) reflection followed by a rotation
2) reflection followed by a translation
3) translation followed by a rotation
4) translation followed by a reflection

192 Which diagram illustrates a correct construction of an altitude of $\triangle ABC$?

1)


2)


3)


4)


193 The volume, in cubic centimeters, of a sphere whose diameter is 6 centimeters is
1) 12π
2) 36π
3) 48π
4) 288π

194 In $\triangle FGH$, $m\angle F = 42$ and an exterior angle at vertex H has a measure of 104. What is $m\angle G$?
1) 34
2) 62
3) 76
4) 146

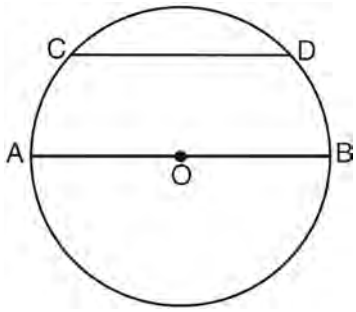
195 What are the center and the radius of the circle whose equation is $(x-5)^2+(y+3)^2=16$?

1) $(-5,3)$ and 16
2) $(5,-3)$ and 16
3) $(-5,3)$ and 4
4) $(5,-3)$ and 4

196 What is the slope of a line that is perpendicular to the line represented by the equation $x+2y=3$?

1) -2
2) 2
3) $-\frac{1}{2}$
4) $\frac{1}{2}$

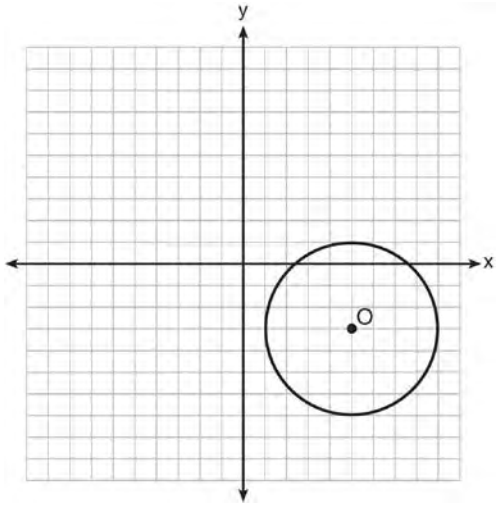
197 In the diagram below of circle O, diameter $\overline{AB}$ is parallel to chord $\overline{CD}$.



If $m\overset{\frown}{CD}=70$, what is $m\overset{\frown}{AC}$?

1) 110
2) 70
3) 55
4) 35

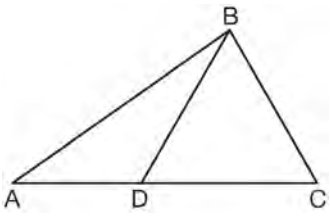
198 The diagram below is a graph of circle O.



Which equation represents circle O?

1) $(x-5)^2+(y+3)^2=4$
2) $(x+5)^2+(y-3)^2=4$
3) $(x-5)^2+(y+3)^2=16$
4) $(x+5)^2+(y-3)^2=16$

199 In the diagram of $\triangle ABC$ below, $\overline{BD}$ is drawn to side $\overline{AC}$.



If $m\angle A=35$, $m\angle ABD=25$, and $m\angle C=60$, which type of triangle is $\triangle BCD$?

1) equilateral
2) scalene
3) obtuse
4) right

Geometry Multiple Choice Regents Exam Questions

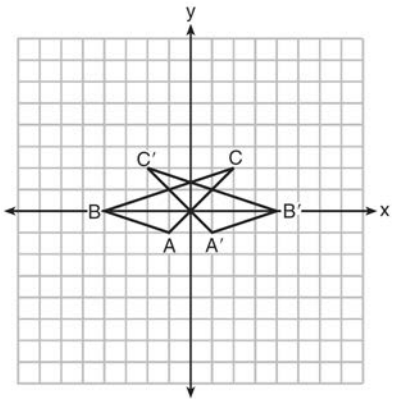
200 Which set of numbers could *not* represent the lengths of the sides of a right triangle?

1) $\{1, 3, \sqrt{10}\}$
2) $\{2, 3, 4\}$
3) $\{3, 4, 5\}$
4) $\{8, 15, 17\}$

201 A circle with the equation $(x+6)^2 + (y-7)^2 = 64$ does *not* include points in Quadrant

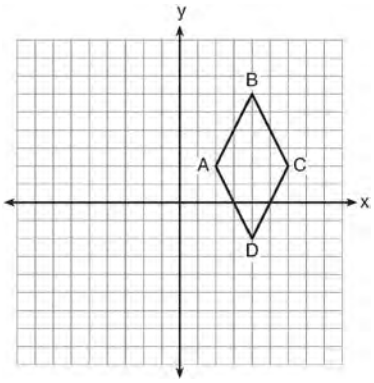
1) I
2) II
3) III
4) IV

202 In the diagram below, under which transformation is $\triangle A'B'C'$ the image of $\triangle ABC$?



1) D_2
2) $r_{x\text{-axis}}$
3) $r_{y\text{-axis}}$
4) $(x, y) \rightarrow (x-2, y)$

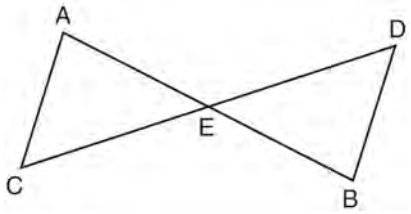
203 Quadrilateral *ABCD* is graphed on the set of axes below.



Which quadrilateral best classifies *ABCD*?

1) trapezoid
2) rectangle
3) rhombus
4) square

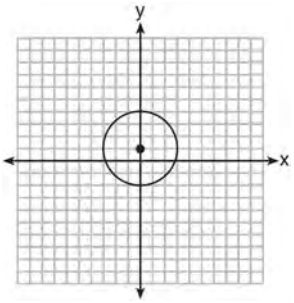
204 In the diagram below, $\triangle AEC \cong \triangle BED$.

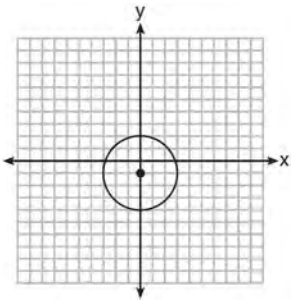


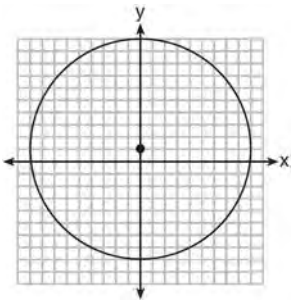
Which statement is *not* always true?

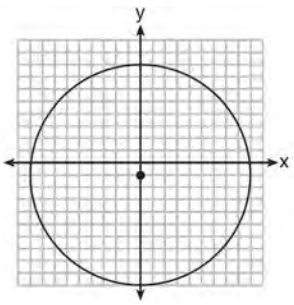
1) $\overline{AC} \cong \overline{BD}$
2) $\overline{CE} \cong \overline{DE}$
3) $\angle EAC \cong \angle EBD$
4) $\angle ACE \cong \angle DBE$

205 Which graph represents a circle whose equation is $x^2 + (y-1)^2 = 9$?

1) 

2) 

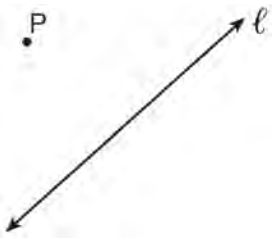
3) 

4) 

206 A rectangular prism has a base with a length of 25, a width of 9, and a height of 12. A second prism has a square base with a side of 15. If the volumes of the two prisms are equal, what is the height of the second prism?

1) 6
2) 8
3) 12
4) 15

207 In the diagram below, point P is not on line ℓ.



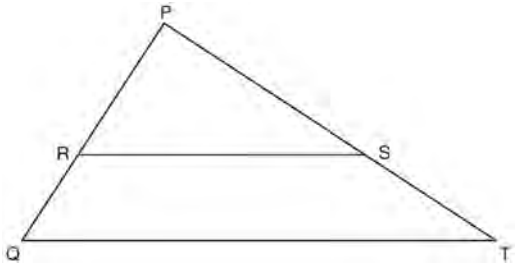
How many distinct planes that contain point P are also perpendicular to line ℓ?

1) 1
2) 2
3) 0
4) an infinite amount

208 Which compound statement is true?

1) A square has four sides or a hexagon has eight sides.
2) A square has four sides and a hexagon has eight sides.
3) If a square has four sides, then a hexagon has eight sides.
4) A square has four sides if and only if a hexagon has eight sides.

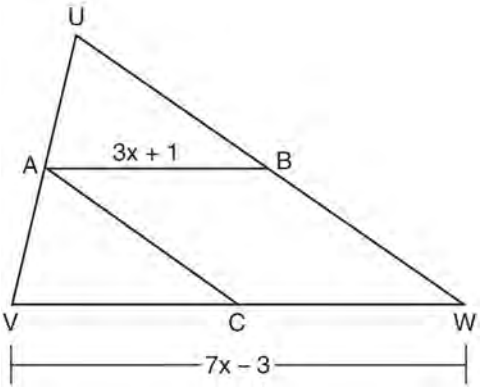
209 Triangle PQT with $\overline{RS} \parallel \overline{QT}$ is shown below.



If $PR = 12$, $RQ = 8$, and $PS = 21$, what is the length of $\overline{PT}$?

1) 14
2) 17
3) 35
4) 38

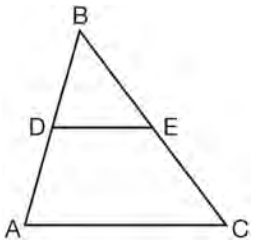
210 In the diagram of $\triangle UVW$ below, A is the midpoint of $\overline{UV}$, B is the midpoint of $\overline{UW}$, C is the midpoint of $\overline{VW}$, and $\overline{AB}$ and $\overline{AC}$ are drawn.



If $VW = 7x - 3$ and $AB = 3x + 1$, what is the length of $\overline{VC}$?

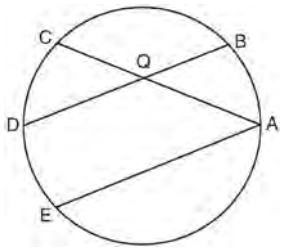
1) 5
2) 13
3) 16
4) 32

211 In $\triangle ABC$, D is the midpoint of $\overline{AB}$ and E is the midpoint of $\overline{BC}$. If $AC = 3x - 15$ and $DE = 6$, what is the value of x?



1) 6
2) 7
3) 9
4) 12

212 In the diagram of the circle shown below, chords $\overline{AC}$ and $\overline{BD}$ intersect at Q, and chords $\overline{AE}$ and $\overline{BD}$ are parallel.



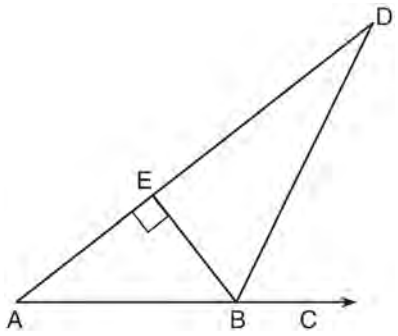
Which statement must always be true?

1) $\overset{\frown}{AB} \cong \overset{\frown}{CD}$
2) $\overset{\frown}{DE} \cong \overset{\frown}{CD}$
3) $\overset{\frown}{AB} \cong \overset{\frown}{DE}$
4) $\overset{\frown}{BD} \cong \overset{\frown}{AE}$

213 What are the coordinates of A', the image of $A(-3,4)$, after a rotation of 180° about the origin?
1) $(4,-3)$
2) $(-4,-3)$
3) $(3,4)$
4) $(3,-4)$

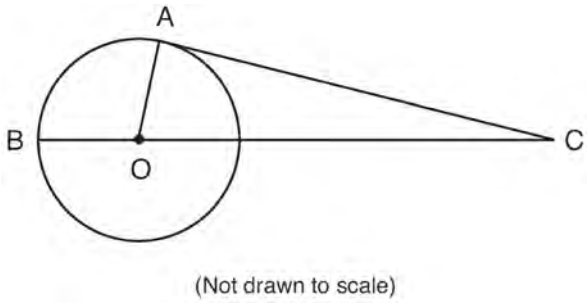
214 Which quadrilateral does *not* always have congruent diagonals?
1) isosceles trapezoid
2) rectangle
3) rhombus
4) square

215 The diagram below shows $\triangle ABD$, with $\overleftrightarrow{ABC}$, $\overline{BE} \perp \overline{AD}$, and $\angle EBD \cong \angle CBD$.



If $m\angle ABE = 52$, what is $m\angle D$?
1) 26
2) 38
3) 52
4) 64

216 In the diagram below of circle O with radius $\overline{OA}$, tangent $\overline{CA}$ and secant $\overline{COB}$ are drawn.



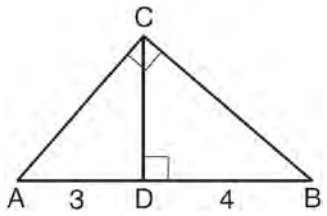
(Not drawn to scale)

If $AC = 20$ cm and $OA = 7$ cm, what is the length of $\overline{OC}$, to the *nearest centimeter*?
1) 19
2) 20
3) 21
4) 27

217 Which equation represents a line that is parallel to the line whose equation is $3x - 2y = 7$?
1) $y = -\frac{3}{2}x + 5$
2) $y = -\frac{2}{3}x + 4$
3) $y = \frac{3}{2}x - 5$
4) $y = \frac{2}{3}x - 4$

218 The solution of the system of equations $y = x^2 - 2$ and $y = x$ is
1) $(1,1)$ and $(-2,-2)$
2) $(2,2)$ and $(-1,-1)$
3) $(1,1)$ and $(2,2)$
4) $(-2,-2)$ and $(-1,-1)$

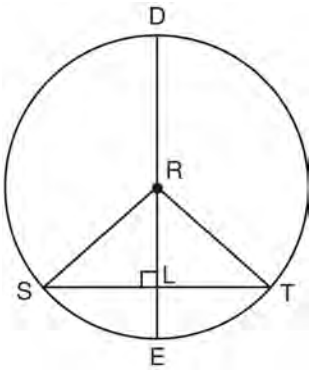
219 In the diagram below of right triangle ABC, $\overline{CD}$ is the altitude to hypotenuse $\overline{AB}$, $AD = 3$, and $DB = 4$.



What is the length of $\overline{CB}$?

1) $2\sqrt{3}$
2) $\sqrt{21}$
3) $2\sqrt{7}$
4) $4\sqrt{3}$

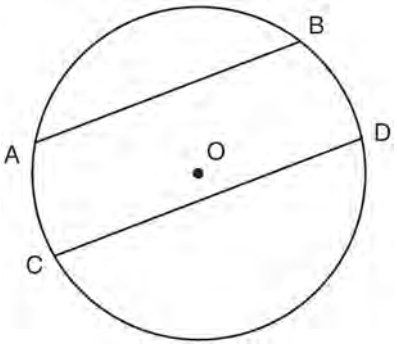
220 In circle R shown below, diameter $\overline{DE}$ is perpendicular to chord $\overline{ST}$ at point L.



Which statement is *not* always true?

1) $\overline{SL} \cong \overline{TL}$
2) $RS = DR$
3) $\overline{RL} \cong \overline{LE}$
4) $(DL)(LE) = (SL)(LT)$

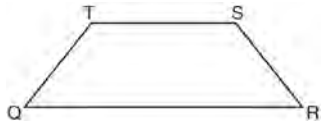
221 In circle O shown in the diagram below, chords $\overline{AB}$ and $\overline{CD}$ are parallel.



If $m\overset{\frown}{AB} = 104$ and $m\overset{\frown}{CD} = 168$, what is $m\overset{\frown}{BD}$?

1) 38
2) 44
3) 88
4) 96

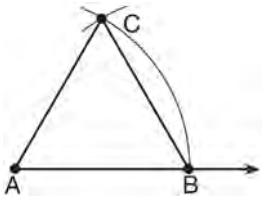
222 In isosceles trapezoid $QRST$ shown below, $\overline{QR}$ and $\overline{TS}$ are bases.



If $m\angle Q = 5x + 3$ and $m\angle R = 7x - 15$, what is $m\angle Q$?

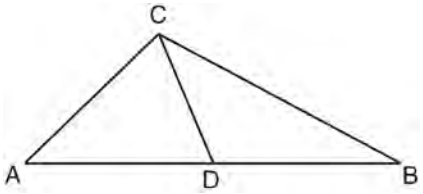
1) 83
2) 48
3) 16
4) 9

223 The diagram below shows the construction of an equilateral triangle.



Which statement justifies this construction?
1) $\angle A + \angle B + \angle C = 180$
2) $m\angle A = m\angle B = m\angle C$
3) $AB = AC = BC$
4) $AB + BC > AC$

224 As shown in the diagram below, $\overline{CD}$ is a median of $\triangle ABC$.

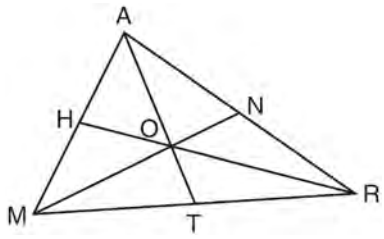


Which statement is *always* true?
1) $\overline{AD} \cong \overline{DB}$
2) $\overline{AC} \cong \overline{AD}$
3) $\angle ACD \cong \angle CDB$
4) $\angle BCD \cong \angle ACD$

225 The sum of the interior angles of a regular polygon is 720°. How many sides does the polygon have?
1) 8
2) 6
3) 5
4) 4

226 The equation of a circle is $(x-2)^2 + (y+5)^2 = 32$. What are the coordinates of the center of this circle and the length of its radius?
1) $(-2,5)$ and 16
2) $(2,-5)$ and 16
3) $(-2,5)$ and $4\sqrt{2}$
4) $(2,-5)$ and $4\sqrt{2}$

227 In the diagram below of $\triangle MAR$, medians $\overline{MN}$, $\overline{AT}$, and $\overline{RH}$ intersect at O.



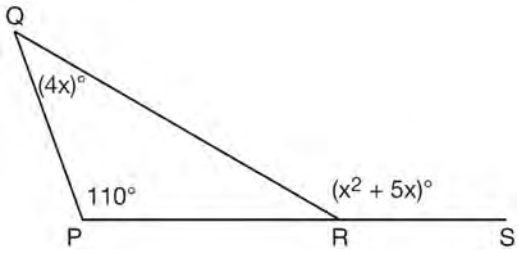
If $TO = 10$, what is the length of $\overline{TA}$?
1) 30
2) 25
3) 20
4) 15

228 The equation of a line is $y = \frac{2}{3}x + 5$. What is an equation of the line that is perpendicular to the given line and that passes through the point $(4,2)$?
1) $y = \frac{2}{3}x - \frac{2}{3}$
2) $y = \frac{3}{2}x - 4$
3) $y = -\frac{3}{2}x + 7$
4) $y = -\frac{3}{2}x + 8$

229 Which statement has the same truth value as the statement "If a quadrilateral is a square, then it is a rectangle"?

1) If a quadrilateral is a rectangle, then it is a square.
2) If a quadrilateral is a rectangle, then it is not a square.
3) If a quadrilateral is not a square, then it is not a rectangle.
4) If a quadrilateral is not a rectangle, then it is not a square.

230 In the diagram of $\triangle PQR$ shown below, $\overline{PR}$ is extended to S, $m\angle P = 110$, $m\angle Q = 4x$, and $m\angle QRS = x^2 + 5x$.



What is $m\angle Q$?

1) 44
2) 40
3) 11
4) 10

231 What is the difference between the sum of the measures of the interior angles of a regular pentagon and the sum of the measures of the exterior angles of a regular pentagon?

1) 36
2) 72
3) 108
4) 180

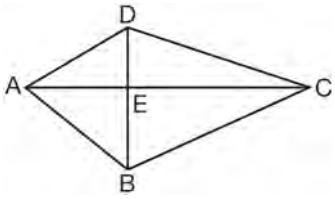
232 Chords $\overline{AB}$ and $\overline{CD}$ intersect at point E in a circle with center at O. If $AE = 8$, $AB = 20$, and $DE = 16$, what is the length of $\overline{CE}$?

1) 6
2) 9
3) 10
4) 12

233 What is the equation of a line passing through the point $(6, 1)$ and parallel to the line whose equation is $3x = 2y + 4$?

1) $y = -\frac{2}{3}x + 5$
2) $y = -\frac{2}{3}x - 3$
3) $y = \frac{3}{2}x - 8$
4) $y = \frac{3}{2}x - 5$

234 In the diagram below of quadrilateral $ABCD$, diagonals $\overline{AEC}$ and $\overline{BED}$ are perpendicular at E.



Which statement is always true based on the given information?

1) $\overline{DE} \cong \overline{EB}$
2) $\overline{AD} \cong \overline{AB}$
3) $\angle DAC \cong \angle BAC$
4) $\angle AED \cong \angle CED$

235 Triangle *ABC* is similar to triangle *DEF*. The lengths of the sides of $\triangle ABC$ are 5, 8, and 11. What is the length of the shortest side of $\triangle DEF$ if its perimeter is 60?

1) 10
2) 12.5
3) 20
4) 27.5

236 The equations of lines *k*, *p*, and *m* are given below:

$k: x + 2y = 6$

$p: 6x + 3y = 12$

$m: -x + 2y = 10$

Which statement is true?

1) $p \perp m$
2) $m \perp k$
3) $k \parallel p$
4) $m \parallel k$

237 Which equation represents a circle whose center is the origin and that passes through the point $(-4, 0)$?

1) $x^2 + y^2 = 8$
2) $x^2 + y^2 = 16$
3) $(x+4)^2 + y^2 = 8$
4) $(x+4)^2 + y^2 = 16$

238 Line segment *AB* has endpoint *A* located at the origin. Line segment *AB* is longest when the coordinates of *B* are

1) $(3, 7)$
2) $(2, -8)$
3) $(-6, 4)$
4) $(-5, -5)$

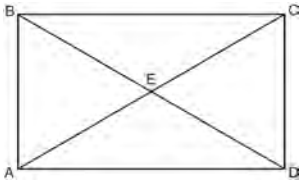
239 Circle *O* is represented by the equation $(x+3)^2 + (y-5)^2 = 48$. The coordinates of the center and the length of the radius of circle *O* are

1) $(-3, 5)$ and $4\sqrt{3}$
2) $(-3, 5)$ and 24
3) $(3, -5)$ and $4\sqrt{3}$
4) $(3, -5)$ and 24

240 What is an equation of the line that passes through the point $(-2, 1)$ and is parallel to the line whose equation is $4x - 2y = 8$?

1) $y = \frac{1}{2}x + 2$
2) $y = \frac{1}{2}x - 2$
3) $y = 2x + 5$
4) $y = 2x - 5$

241 As shown in the diagram of rectangle *ABCD* below, diagonals $\overline{AC}$ and $\overline{BD}$ intersect at *E*.

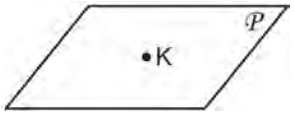


If $AE = x + 2$ and $BD = 4x - 16$, then the length of $\overline{AC}$ is

1) 6
2) 10
3) 12
4) 24

242 In circle O, diameter $\overline{AB}$ intersects chord $\overline{CD}$ at E. If $CE = ED$, then $\angle CEA$ is which type of angle?
1) straight
2) obtuse
3) acute
4) right

243 In the diagram below, point K is in plane $\mathcal{P}$.



How many lines can be drawn through K, perpendicular to plane $\mathcal{P}$?
1) 1
2) 2
3) 0
4) an infinite number

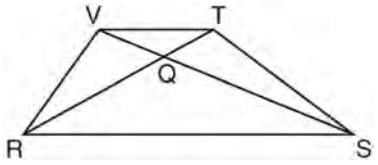
244 Triangle ABC has the coordinates $A(1,2)$, $B(5,2)$, and $C(5,5)$. Triangle ABC is rotated 180° about the origin to form triangle $A'B'C'$. Triangle $A'B'C'$ is
1) acute
2) isosceles
3) obtuse
4) right

245 Point W is located in plane $\mathcal{R}$. How many distinct lines passing through point W are perpendicular to plane $\mathcal{R}$?
1) one
2) two
3) zero
4) infinite

246 What is an equation of the line that passes through the point $(2,4)$ and is perpendicular to the line whose equation is $3y = 6x + 3$?
1) $y = -\frac{1}{2}x + 5$
2) $y = -\frac{1}{2}x + 4$
3) $y = 2x - 6$
4) $y = 2x$

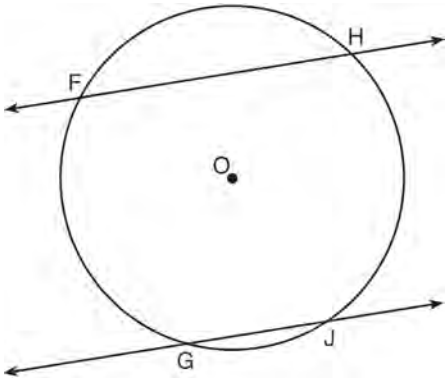
247 Which set of equations represents two circles that have the same center?
1) $x^2 + (y+4)^2 = 16$ and $(x+4)^2 + y^2 = 16$
2) $(x+3)^2 + (y-3)^2 = 16$ and $(x-3)^2 + (y+3)^2 = 25$
3) $(x-7)^2 + (y-2)^2 = 16$ and $(x+7)^2 + (y+2)^2 = 25$
4) $(x-2)^2 + (y-5)^2 = 16$ and $(x-2)^2 + (y-5)^2 = 25$

248 In trapezoid $RSTV$ with bases $\overline{RS}$ and $\overline{VT}$, diagonals $\overline{RT}$ and $\overline{SV}$ intersect at Q.



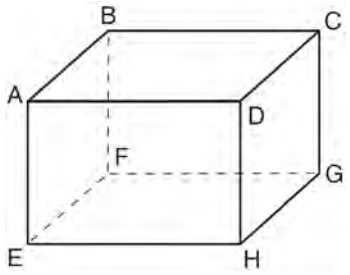
If trapezoid $RSTV$ is *not* isosceles, which triangle is equal in area to $\triangle RSV$?
1) $\triangle RQV$
2) $\triangle RST$
3) $\triangle RVT$
4) $\triangle SVT$

249 Parallel secants $\overleftrightarrow{FH}$ and $\overleftrightarrow{GJ}$ intersect circle *O*, as shown in the diagram below.



If m$\overset{\frown}{FH}$ = 106 and m$\overset{\frown}{GJ}$ = 24, then m$\overset{\frown}{FG}$ equals
1) 106
2) 115
3) 130
4) 156

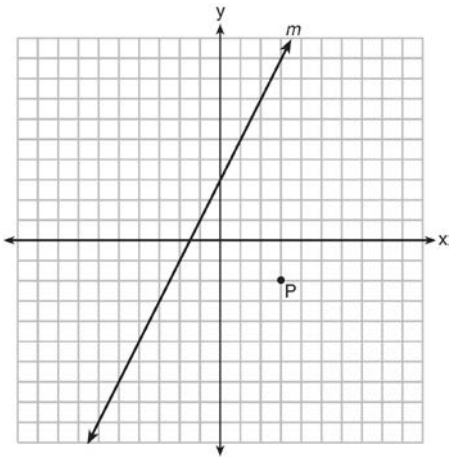
250 A rectangular right prism is shown in the diagram below.



Which pair of edges are *not* coplanar?
1) $\overline{BF}$ and $\overline{CG}$
2) $\overline{BF}$ and $\overline{DH}$
3) $\overline{EF}$ and $\overline{CD}$
4) $\overline{EF}$ and $\overline{BC}$

251 In $\triangle JKL$, $\overline{JL} \cong \overline{KL}$. If m$\angle J$ = 58, then m$\angle L$ is
1) 61
2) 64
3) 116
4) 122

252 Line *m* and point *P* are shown in the graph below.



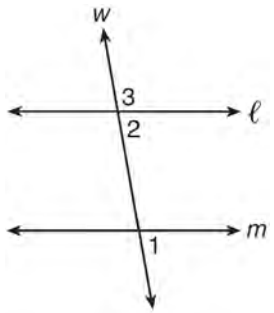
Which equation represents the line passing through *P* and parallel to line *m*?
1) $y - 3 = 2(x + 2)$
2) $y + 2 = 2(x - 3)$
3) $y - 3 = -\frac{1}{2}(x + 2)$
4) $y + 2 = -\frac{1}{2}(x - 3)$

253 What is the equation of the circle with its center at $(-1, 2)$ and that passes through the point $(1, 2)$?
1) $(x + 1)^2 + (y - 2)^2 = 4$
2) $(x - 1)^2 + (y + 2)^2 = 4$
3) $(x + 1)^2 + (y - 2)^2 = 2$
4) $(x - 1)^2 + (y + 2)^2 = 2$

254 As shown in the diagram below, a landscaper uses a cylindrical lawn roller on a lawn. The roller has a radius of 9 inches and a width of 42 inches.

To the *nearest square inch*, the area the roller covers in one complete rotation is
1) 2,374
2) 2,375
3) 10,682
4) 10,688

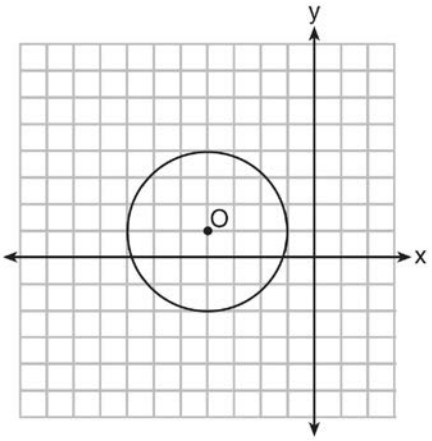
255 In the diagram below, line ℓ is parallel to line m, and line w is a transversal.



(Not drawn to scale)

If $m\angle 2 = 3x + 17$ and $m\angle 3 = 5x - 21$, what is $m\angle 1$?
1) 19
2) 23
3) 74
4) 86

256 What is the equation of circle O shown in the diagram below?



1) $(x+4)^2 + (y-1)^2 = 3$
2) $(x-4)^2 + (y+1)^2 = 3$
3) $(x+4)^2 + (y-1)^2 = 9$
4) $(x-4)^2 + (y+1)^2 = 9$

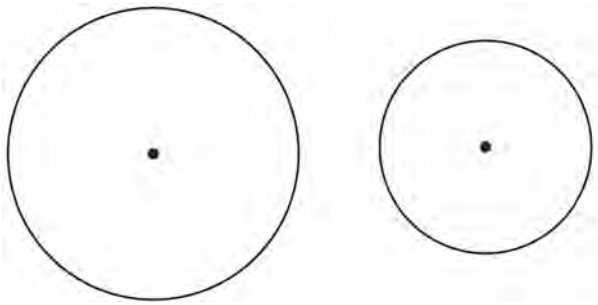
257 Secants $\overline{JKL}$ and $\overline{JMN}$ are drawn to circle O from an external point, J. If $JK = 8$, $LK = 4$, and $JM = 6$, what is the length of $\overline{JN}$?
1) 16
2) 12
3) 10
4) 8

258 In parallelogram $QRST$, diagonal $\overline{QS}$ is drawn. Which statement must always be true?
1) $\triangle QRS$ is an isosceles triangle.
2) $\triangle STQ$ is an acute triangle.
3) $\triangle STQ \cong \triangle QRS$
4) $\overline{QS} \cong \overline{QT}$

259 What are the coordinates of the image of point $A(2,-7)$ under the translation $(x,y) \rightarrow (x-3, y+5)$?

1) $(-1,-2)$
2) $(-1,2)$
3) $(5,-12)$
4) $(5,12)$

260 How many common tangent lines can be drawn to the circles shown below?



1) 1
2) 2
3) 3
4) 4

261 In $\triangle ABC$, $m\angle A = 65$ and $m\angle B$ is greater than $m\angle A$. The lengths of the sides of $\triangle ABC$ in order from smallest to largest are

1) $\overline{AB}, \overline{BC}, \overline{AC}$
2) $\overline{BC}, \overline{AB}, \overline{AC}$
3) $\overline{AC}, \overline{BC}, \overline{AB}$
4) $\overline{AB}, \overline{AC}, \overline{BC}$

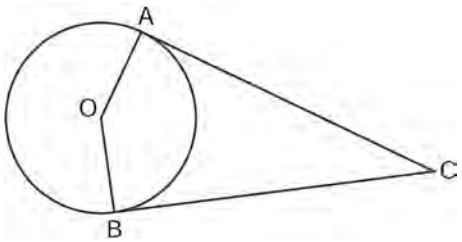
262 What is the length of a line segment whose endpoints have coordinates $(5,3)$ and $(1,6)$?

1) 5
2) 25
3) $\sqrt{17}$
4) $\sqrt{29}$

263 What is the length of $\overline{RS}$ with $R(-2,3)$ and $S(4,5)$?

1) $2\sqrt{2}$
2) 40
3) $2\sqrt{10}$
4) $2\sqrt{17}$

264 In the diagram below, $\overline{AC}$ and $\overline{BC}$ are tangent to circle O at A and B, respectively, from external point C.



If $m\angle ACB = 38$, what is $m\angle AOB$?

1) 71
2) 104
3) 142
4) 161

265 In a coordinate plane, the locus of points 5 units from the x-axis is the

1) lines $x = 5$ and $x = -5$
2) lines $y = 5$ and $y = -5$
3) line $x = 5$, only
4) line $y = 5$, only

266 From external point *A*, two tangents to circle *O* are drawn. The points of tangency are *B* and *C*. Chord $\overline{BC}$ is drawn to form $\triangle ABC$. If $m\angle ABC = 66$, what is $m\angle A$?

1) 33
2) 48
3) 57
4) 66

267 What are the coordinates of the center of a circle if the endpoints of its diameter are $A(8,-4)$ and $B(-3,2)$?

1) $(2.5,1)$
2) $(2.5,-1)$
3) $(5.5,-3)$
4) $(5.5,3)$

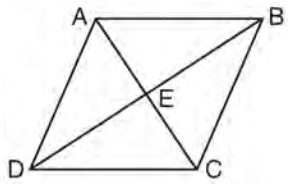
268 In a circle whose equation is $(x-1)^2+(y+3)^2=9$, the coordinates of the center and length of its radius are

1) $(1,-3)$ and $r=81$
2) $(-1,3)$ and $r=81$
3) $(1,-3)$ and $r=3$
4) $(-1,3)$ and $r=3$

269 Given: "If a polygon is a triangle, then the sum of its interior angles is 180°." What is the contrapositive of this statement?

1) "If the sum of the interior angles of a polygon is not 180°, then it is not a triangle."
2) "A polygon is a triangle if and only if the sum of its interior angles is 180°."
3) "If a polygon is not a triangle, then the sum of the interior angles is not 180°."
4) "If the sum of the interior angles of a polygon is 180°, then it is a triangle."

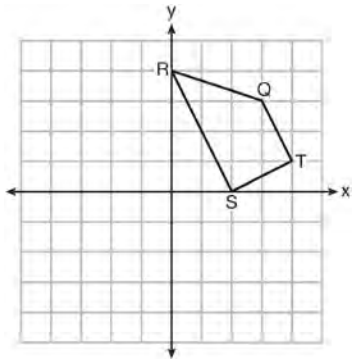
270 In the diagram below of rhombus *ABCD*, the diagonals $\overline{AC}$ and $\overline{BD}$ intersect at *E*.



If $AC = 18$ and $BD = 24$, what is the length of one side of rhombus *ABCD?*

1) 15
2) 18
3) 24
4) 30

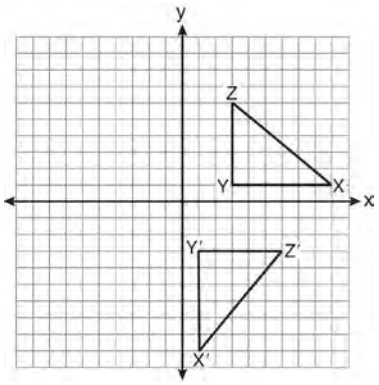
271 Trapezoid *QRST* is graphed on the set of axes below.



Under which transformation will there be *no* invariant points?

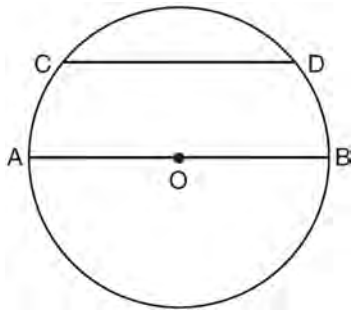
1) $r_{y=0}$
2) $r_{x=0}$
3) $r_{(0,0)}$
4) $r_{y=x}$

272 In the diagram below, under which transformation is $\triangle X'Y'Z'$ the image of $\triangle XYZ$?



1) dilation
2) reflection
3) rotation
4) translation

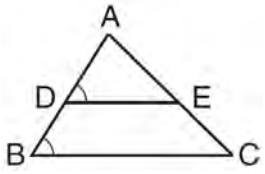
273 In the diagram of circle O below, chord $\overline{CD}$ is parallel to diameter $\overline{AOB}$ and $m\overset{\frown}{CD} = 110$.

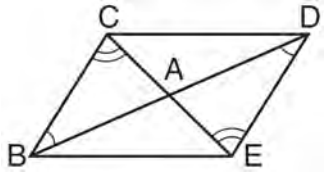


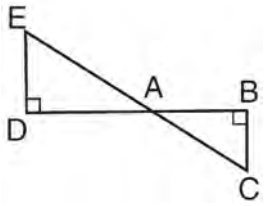
What is $m\overset{\frown}{DB}$?
1) 35
2) 55
3) 70
4) 110

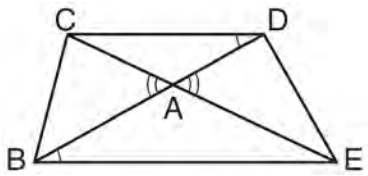
274 Which numbers could represent the lengths of the sides of a triangle?
1) 5, 9, 14
2) 7, 7, 15
3) 1, 2, 4
4) 3, 6, 8

275 For which diagram is the statement $\triangle ABC \sim \triangle ADE$ *not* always true??

1) 

2) 

3) 

4) 

276 Square $ABCD$ has vertices $A(-2,-3)$, $B(4,-1)$, $C(2,5)$, and $D(-4,3)$. What is the length of a side of the square?
1) $2\sqrt{5}$
2) $2\sqrt{10}$
3) $4\sqrt{5}$
4) $10\sqrt{2}$

277 What is an equation of the line that passes through the point $(4,5)$ and is parallel to the line whose equation is $y = \frac{2}{3}x - 4$?

1) $2y + 3x = 11$
2) $2y + 3x = 22$
3) $3y - 2x = 2$
4) $3y - 2x = 7$

278 The lateral area of a right circular cone is equal to 120π cm^2. If the base of the cone has a diameter of 24 cm, what is the length of the slant height, in centimeters?

1) 2.5
2) 5
3) 10
4) 15.7

279 Which statement is the inverse of "If $x + 3 = 7$, then $x = 4$"?

1) If $x = 4$, then $x + 3 = 7$.
2) If $x \neq 4$, then $x + 3 \neq 7$.
3) If $x + 3 \neq 7$, then $x \neq 4$.
4) If $x + 3 = 7$, then $x \neq 4$.

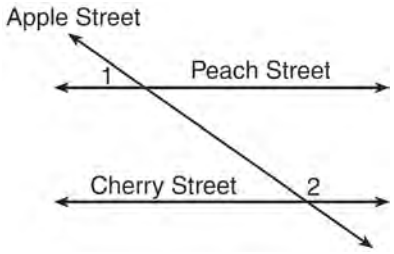
280 A circle whose center has coordinates $(-3,4)$ passes through the origin. What is the equation of the circle?

1) $(x+3)^2 + (y-4)^2 = 5$
2) $(x+3)^2 + (y-4)^2 = 25$
3) $(x-3)^2 + (y+4)^2 = 5$
4) $(x-3)^2 + (y+4)^2 = 25$

281 Line segment AB is a diameter of circle O whose center has coordinates $(6,8)$. What are the coordinates of point B if the coordinates of point A are $(4,2)$?

1) $(1,3)$
2) $(5,5)$
3) $(8,14)$
4) $(10,10)$

282 Peach Street and Cherry Street are parallel. Apple Street intersects them, as shown in the diagram below.



If $m\angle 1 = 2x + 36$ and $m\angle 2 = 7x - 9$, what is $m\angle 1$?

1) 9
2) 17
3) 54
4) 70

283 The measures of the angles of a triangle are in the ratio $2:3:4$. In degrees, the measure of the *largest* angle of the triangle is

1) 20
2) 40
3) 80
4) 100

284 The measure of an interior angle of a regular polygon is 120°. How many sides does the polygon have?
1) 5
2) 6
3) 3
4) 4

285 The coordinates of point P are $(7,1)$. What are the coordinates of the image of P after $R_{90°}$ about the origin?
1) $(1,7)$
2) $(-7,-1)$
3) $(1,-7)$
4) $(-1,7)$

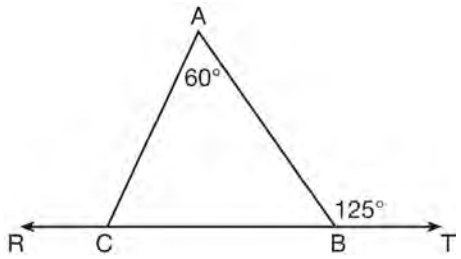
286 What are the coordinates of the midpoint of the line segment with endpoints $(2,-5)$ and $(8,3)$?
1) $(3,-4)$
2) $(3,-1)$
3) $(5,-4)$
4) $(5,-1)$

287 Plane $\mathcal{P}$ is parallel to plane Q. If plane $\mathcal{P}$ is perpendicular to line ℓ, then plane Q
1) contains line ℓ
2) is parallel to line ℓ
3) is perpendicular to line ℓ
4) intersects, but is not perpendicular to line ℓ

288 In quadrilateral *ABCD*, the diagonals bisect its angles. If the diagonals are *not* congruent, quadrilateral *ABCD* must be a
1) square
2) rectangle
3) rhombus
4) trapezoid

289 Given the statement: One is a prime number. What is the negation and the truth value of the negation?
1) One is not a prime number; true
2) One is not a prime number; false
3) One is a composite number; true
4) One is a composite number; false

290 In the diagram below, $\overleftrightarrow{RCBT}$ and $\triangle ABC$ are shown with $m\angle A = 60$ and $m\angle ABT = 125$.



What is $m\angle ACR$?
1) 125
2) 115
3) 65
4) 55

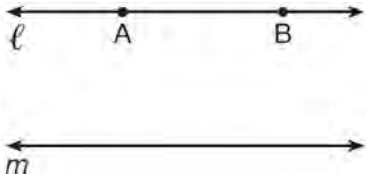
291 If the surface area of a sphere is 144π square centimeters, what is the length of the diameter of the sphere, in centimeters?
1) 36
2) 18
3) 12
4) 6

292 What are the coordinates of P', the image of point $P(x,y)$ after translation $T_{4,4}$?
1) $(x-4, y-4)$
2) $(x+4, y+4)$
3) $(4x, 4y)$
4) $(4,4)$

293 The coordinates of the endpoints of the diameter of a circle are $(2,0)$ and $(2,-8)$. What is the equation of the circle?
1) $(x-2)^2+(y+4)^2=16$
2) $(x+2)^2+(y-4)^2=16$
3) $(x-2)^2+(y+4)^2=8$
4) $(x+2)^2+(y-4)^2=8$

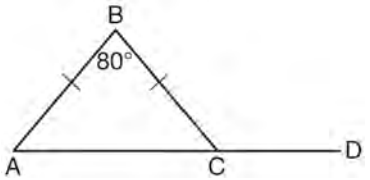
294 In triangles ABC and DEF, $AB=4$, $AC=5$, $DE=8$, $DF=10$, and $\angle A \cong \angle D$. Which method could be used to prove $\triangle ABC \sim \triangle DEF$?
1) AA
2) SAS
3) SSS
4) ASA

295 Points A and B are on line ℓ, and line ℓ is parallel to line m, as shown in the diagram below.



How many points are in the same plane as ℓ and m and equidistant from ℓ and m, and also equidistant from A and B?
1) 1
2) 2
3) 3
4) 0

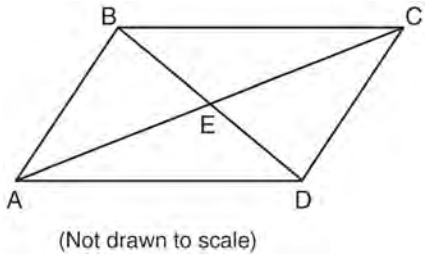
296 In the diagram below of isosceles $\triangle ABC$, the measure of vertex angle B is 80°. If $\overline{AC}$ extends to point D, what is $m\angle BCD$?



1) 50
2) 80
3) 100
4) 130

297 If distinct planes $\mathcal{R}$ and $\mathcal{S}$ are both perpendicular to line ℓ, which statement must always be true?
1) Plane $\mathcal{R}$ is parallel to plane $\mathcal{S}$.
2) Plane $\mathcal{R}$ is perpendicular to plane $\mathcal{S}$.
3) Planes $\mathcal{R}$ and $\mathcal{S}$ and line ℓ are all parallel.
4) The intersection of planes $\mathcal{R}$ and $\mathcal{S}$ is perpendicular to line ℓ.

298 In the diagram below, parallelogram $ABCD$ has vertices $A(1,3)$, $B(5,7)$, $C(10,7)$, and $D(6,3)$. Diagonals $\overline{AC}$ and $\overline{BD}$ intersect at E.

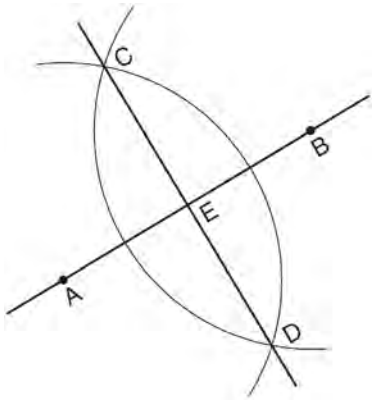


(Not drawn to scale)

What are the coordinates of point E?

1) $(0.5,2)$
2) $(4.5,2)$
3) $(5.5,5)$
4) $(7.5,7)$

299 Based on the construction below, which conclusion is *not* always true?

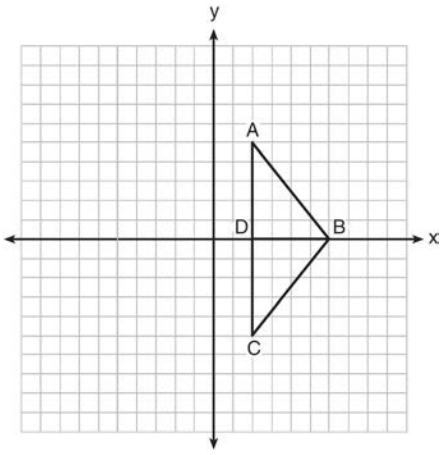


1) $\overline{AB} \perp \overline{CD}$
2) $AB = CD$
3) $AE = EB$
4) $CE = DE$

300 The equations $y = 2x + 3$ and $y = -x^2 - x + 1$ are graphed on the same set of axes. The coordinates of a point in the solution of this system of equations are

1) $(0,1)$
2) $(1,5)$
3) $(-1,-2)$
4) $(-2,-1)$

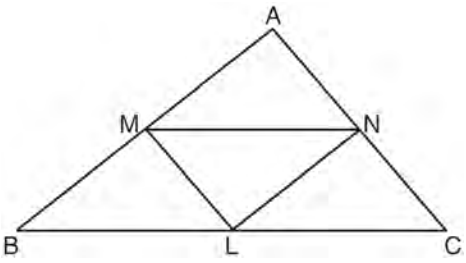
301 As shown in the diagram below, when right triangle DAB is reflected over the x-axis, its image is triangle DCB.



Which statement justifies why $\overline{AB} \cong \overline{CB}$?

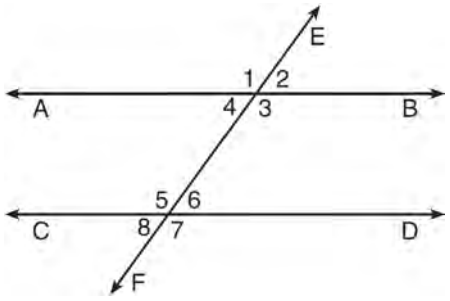
1) Distance is preserved under reflection.
2) Orientation is preserved under reflection.
3) Points on the line of reflection remain invariant.
4) Right angles remain congruent under reflection.

302 In $\triangle ABC$ shown below, L is the midpoint of $\overline{BC}$, M is the midpoint of $\overline{AB}$, and N is the midpoint of $\overline{AC}$.



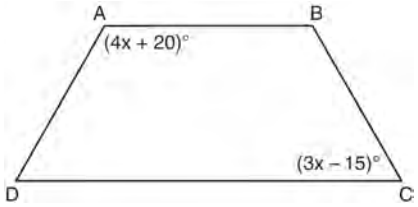
If $MN = 8$, $ML = 5$, and $NL = 6$, the perimeter of trapezoid $BMNC$ is
1) 26
2) 28
3) 30
4) 35

303 Transversal $\overleftrightarrow{EF}$ intersects $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$, as shown in the diagram below.



Which statement could always be used to prove $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$?
1) $\angle 2 \cong \angle 4$
2) $\angle 7 \cong \angle 8$
3) $\angle 3$ and $\angle 6$ are supplementary
4) $\angle 1$ and $\angle 5$ are supplementary

304 In the diagram of trapezoid $ABCD$ below, $\overline{AB} \parallel \overline{DC}$, $\overline{AD} \cong \overline{BC}$, $m\angle A = 4x + 20$, and $m\angle C = 3x - 15$.

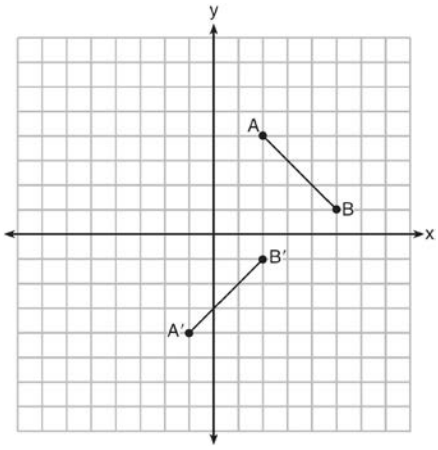


What is $m\angle D$?
1) 25
2) 35
3) 60
4) 90

305 Point A lies on plane $\mathcal{P}$. How many distinct lines passing through point A are perpendicular to plane $\mathcal{P}$?
1) 1
2) 2
3) 0
4) infinite

306 Plane $\mathcal{A}$ and plane $\mathcal{B}$ are two distinct planes that are both perpendicular to line ℓ. Which statement about planes $\mathcal{A}$ and $\mathcal{B}$ is true?
1) Planes $\mathcal{A}$ and $\mathcal{B}$ have a common edge, which forms a line.
2) Planes $\mathcal{A}$ and $\mathcal{B}$ are perpendicular to each other.
3) Planes $\mathcal{A}$ and $\mathcal{B}$ intersect each other at exactly one point.
4) Planes $\mathcal{A}$ and $\mathcal{B}$ are parallel to each other.

307 In the diagram below, $\overline{A'B'}$ is the image of $\overline{AB}$ under which single transformation?



1) dilation
2) rotation
3) translation
4) glide reflection

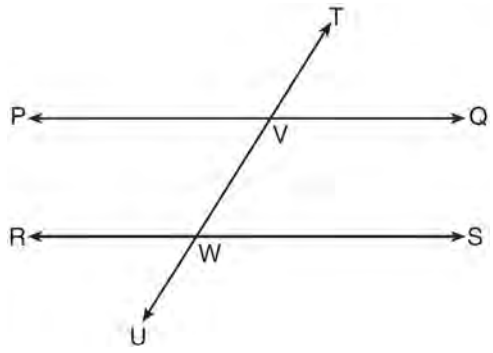
308 The vertex angle of an isosceles triangle measures 15 degrees more than one of its base angles. How many degrees are there in a base angle of the triangle?
1) 50
2) 55
3) 65
4) 70

309 Point M is the midpoint of $\overline{AB}$. If the coordinates of M are $(2,8)$ and the coordinates of A are $(10,12)$, what are the coordinates of B?
1) $(6,10)$
2) $(-6,4)$
3) $(-8,-4)$
4) $(18,16)$

310 The diameter of a sphere is 12 inches. What is the volume of the sphere to the *nearest cubic inch*?
1) 288
2) 452
3) 905
4) 7,238

311 If line ℓ is perpendicular to distinct planes $\mathcal{P}$ and $\mathcal{Q}$, then planes $\mathcal{P}$ and $\mathcal{Q}$
1) are parallel
2) contain line ℓ
3) are perpendicular
4) intersect, but are *not* perpendicular

312 In the diagram below, transversal $\overleftrightarrow{TU}$ intersects $\overleftrightarrow{PQ}$ and $\overleftrightarrow{RS}$ at V and W, respectively.



If $m\angle TVQ = 5x - 22$ and $m\angle VWS = 3x + 10$, for which value of x is $\overleftrightarrow{PQ} \parallel \overleftrightarrow{RS}$?
1) 6
2) 16
3) 24
4) 28

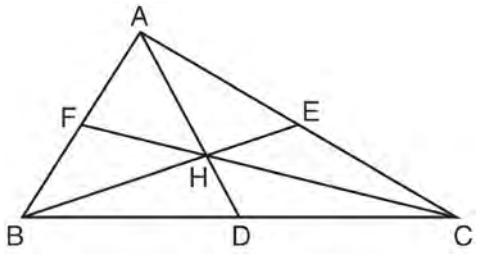
313 The image of rhombus *VWXY* preserves which properties under the transformation $T_{2,-3}$?

1) parallelism, only
2) orientation, only
3) both parallelism and orientation
4) neither parallelism nor orientation

314 When the system of equations $y + 2x = x^2$ and $y = x$ is graphed on a set of axes, what is the total number of points of intersection?

1) 1
2) 2
3) 3
4) 0

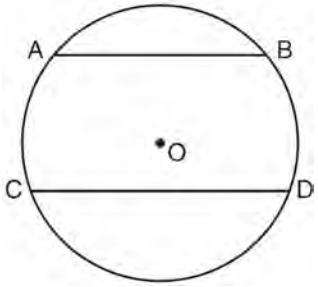
315 In the diagram below of $\triangle ABC$, point *H* is the intersection of the three medians.



If $\overline{DH}$ measures 2.4 centimeters, what is the length, in centimeters, of $\overline{AD}$?

1) 3.6
2) 4.8
3) 7.2
4) 9.6

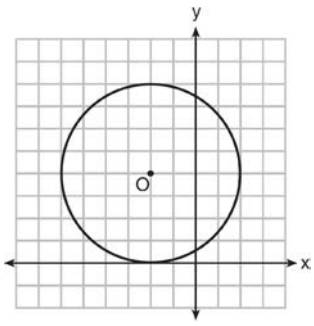
316 In the diagram below of circle *O*, chord $\overline{AB}$ is parallel to chord $\overline{CD}$.



A correct justification for $m\overset{\frown}{AC} = m\overset{\frown}{BD}$ in circle *O* is

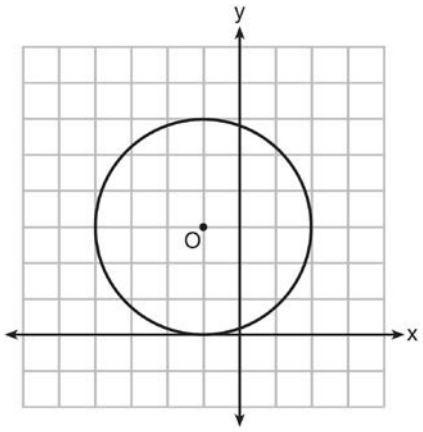
1) parallel chords intercept congruent arcs
2) congruent chords intercept congruent arcs
3) if two chords are parallel, then they are congruent
4) if two chords are equidistant from the center, then the arcs they intercept are congruent

317 What is an equation of circle *O* shown in the graph below?



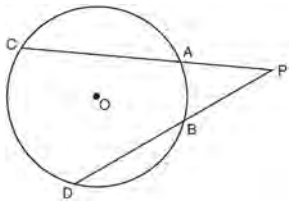
1) $(x-2)^2 + (y+4)^2 = 4$
2) $(x-2)^2 + (y+4)^2 = 16$
3) $(x+2)^2 + (y-4)^2 = 4$
4) $(x+2)^2 + (y-4)^2 = 16$

318 Circle O is graphed on the set of axes below. Which equation represents circle O?



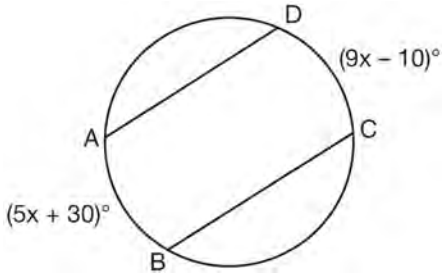
1) $(x+1)^2+(y-3)^2=9$
2) $(x-1)^2+(y+3)^2=9$
3) $(x+1)^2+(y-3)^2=6$
4) $(x-1)^2+(y+3)^2=6$

319 In the diagram below of circle O, $\overline{PAC}$ and $\overline{PBD}$ are secants.



If $m\overset{\frown}{CD} = 70$ and $m\overset{\frown}{AB} = 20$, what is the degree measure of $\angle P$?
1) 25
2) 35
3) 45
4) 50

320 In the diagram of the circle below, $\overline{AD} \parallel \overline{BC}$, $\overset{\frown}{AB} = (5x+30)°$, and $\overset{\frown}{CD} = (9x-10)°$.

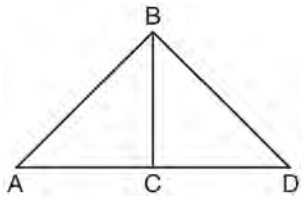


What is $m\overset{\frown}{AB}$?
1) 5
2) 10
3) 55
4) 80

321 The lengths of two sides of a triangle are 7 and 11. Which inequality represents all possible values for x, the length of the third side of the triangle?
1) $4 \le x \le 18$
2) $4 < x \le 18$
3) $4 \le x < 18$
4) $4 < x < 18$

322 What is the slope of the line perpendicular to the line represented by the equation $2x + 4y = 12$?
1) -2
2) 2
3) $-\frac{1}{2}$
4) $\frac{1}{2}$

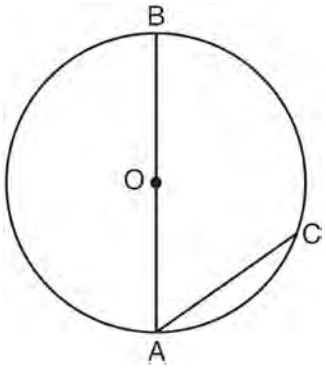
323 Given: $\triangle ABD$, $\overline{BC}$ is the perpendicular bisector of $\overline{AD}$



Which statement can *not* always be proven?

1) $\overline{AC} \cong \overline{DC}$
2) $\overline{BC} \cong \overline{CD}$
3) $\angle ACB \cong \angle DCB$
4) $\triangle ABC \cong \triangle DBC$

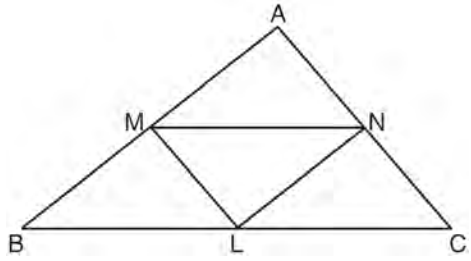
324 As shown in the diagram below, $\overline{AB}$ is a diameter of circle O, and chord $\overline{AC}$ is drawn.



If $m\angle BAC = 70$, then $m\overset{\frown}{AC}$ is

1) 40
2) 70
3) 110
4) 140

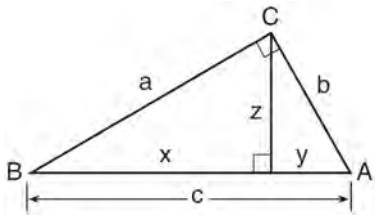
325 In $\triangle ABC$ shown below, L is the midpoint of $\overline{BC}$, M is the midpoint of $\overline{AB}$, and N is the midpoint of $\overline{AC}$.



If $MN = 8$, $ML = 5$, and $NL = 6$, the perimeter of trapezoid $BMNC$ is

1) 35
2) 31
3) 28
4) 26

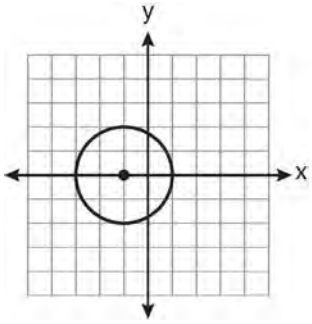
326 In the diagram below of right triangle ABC, an altitude is drawn to the hypotenuse $\overline{AB}$.

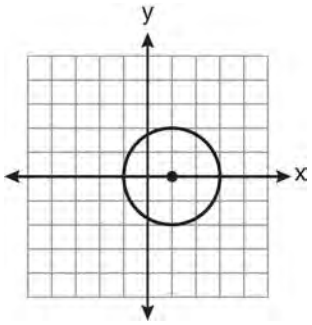


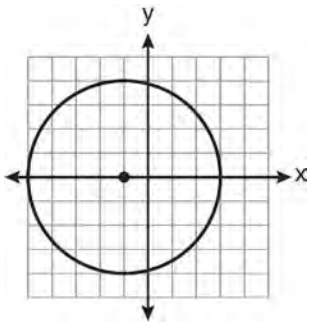
Which proportion would always represent a correct relationship of the segments?

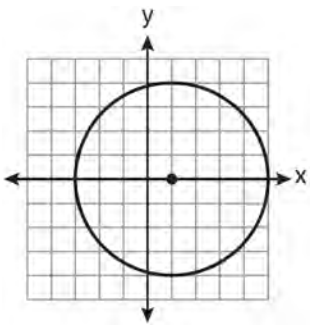
1) $\frac{c}{z} = \frac{z}{y}$
2) $\frac{c}{a} = \frac{a}{y}$
3) $\frac{x}{z} = \frac{z}{y}$
4) $\frac{y}{b} = \frac{b}{x}$

327 Which graph represents the graph of the equation $(x-1)^2+y^2=4$?

1) 

2) 

3) 

4) 

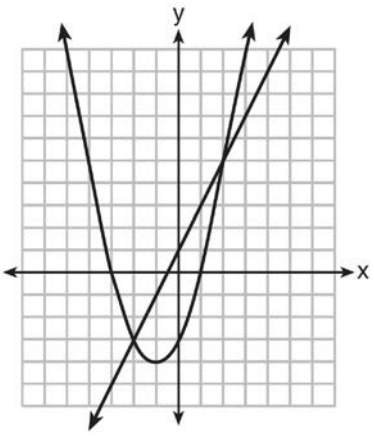
328 In $\triangle FGH$, $m\angle F = m\angle H$, $GF = x+40$, $HF = 3x-20$, and $GH = 2x+20$. The length of $\overline{GH}$ is

1) 20
2) 40
3) 60
4) 80

329 What is the solution of the system of equations graphed below?

$$y = 2x+1$$

$$y = x^2+2x-3$$

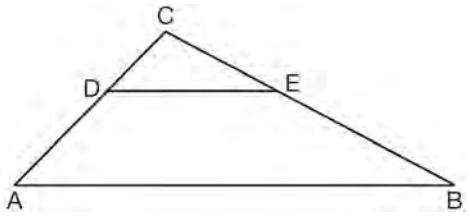


1) $(0,-3)$
2) $(-1,-4)$
3) $(-3,0)$ and $(1,0)$
4) $(-2,-3)$ and $(2,5)$

330 How many points are 5 units from a line and also equidistant from two points on the line?

1) 1
2) 2
3) 3
4) 0

331 In the diagram of $\triangle ABC$ below, $\overline{DE} \parallel \overline{AB}$.



If $CD = 4$, $CA = 10$, $CE = x + 2$, and $EB = 4x - 7$, what is the length of $\overline{CE}$?

1) 10
2) 8
3) 6
4) 4

332 In $\triangle ABC$, $\angle A \cong \angle B$ and $\angle C$ is an obtuse angle. Which statement is true?

1) $\overline{AC} \cong \overline{AB}$ and $\overline{BC}$ is the longest side.
2) $\overline{AC} \cong \overline{BC}$ and $\overline{AB}$ is the longest side.
3) $\overline{AC} \cong \overline{AB}$ and $\overline{BC}$ is the shortest side.
4) $\overline{AC} \cong \overline{BC}$ and $\overline{AB}$ is the shortest side.

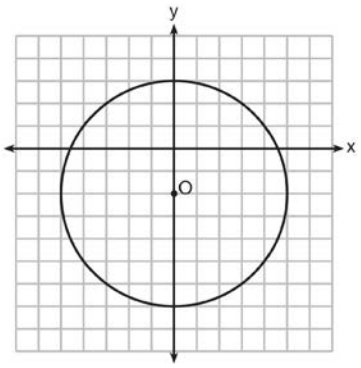
333 If the vertices of $\triangle ABC$ are $A(-2,4)$, $B(-2,8)$, and $C(-5,6)$, then $\triangle ABC$ is classified as

1) right
2) scalene
3) isosceles
4) equilateral

334 What are the truth values of the statement "Opposite angles of a trapezoid are always congruent" and its negation?

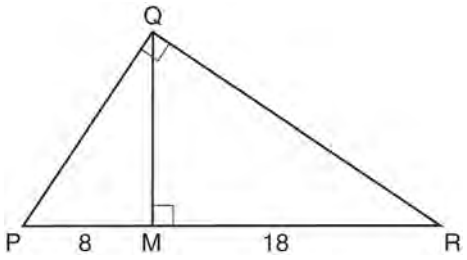
1) The statement is true and its negation is true.
2) The statement is true and its negation is false.
3) The statement is false and its negation is true.
4) The statement is false and its negation is false.

335 Which equation represents circle O shown in the graph below?



1) $x^2 + (y-2)^2 = 10$
2) $x^2 + (y+2)^2 = 10$
3) $x^2 + (y-2)^2 = 25$
4) $x^2 + (y+2)^2 = 25$

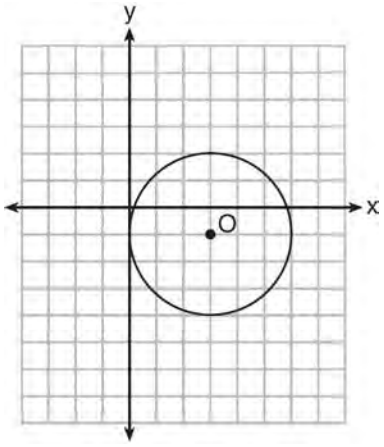
336 In the diagram below, $\overline{QM}$ is an altitude of right triangle PQR, $PM = 8$, and $RM = 18$.



What is the length of $\overline{QM}$?

1) 20
2) 16
3) 12
4) 10

337 What is the equation for circle O shown in the graph below?



1) $(x-3)^2+(y+1)^2=6$
2) $(x+3)^2+(y-1)^2=6$
3) $(x-3)^2+(y+1)^2=9$
4) $(x+3)^2+(y-1)^2=9$

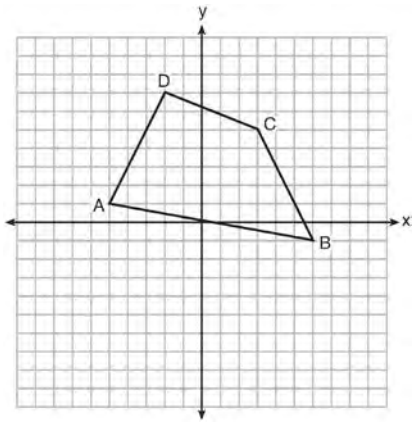
338 When the system of equations $y+2=(x-4)^2$ and $2x+y-6=0$ is solved graphically, the solution is
1) $(-4,-2)$ and $(-2,2)$
2) $(4,-2)$ and $(2,2)$
3) $(-4,2)$ and $(-6,6)$
4) $(4,2)$ and $(6,6)$

339 The sides of a triangle are 8, 12, and 15. The longest side of a similar triangle is 18. What is the ratio of the perimeter of the smaller triangle to the perimeter of the larger triangle?
1) 2:3
2) 4:9
3) 5:6
4) 25:36

340 In $\triangle ABC$, $m\angle A = 3x+1$, $m\angle B = 4x-17$, and $m\angle C = 5x-20$. Which type of triangle is $\triangle ABC$?
1) right
2) scalene
3) isosceles
4) equilateral

341 In $\triangle CAT$, $m\angle C = 65$, $m\angle A = 40$, and B is a point on side $\overline{CA}$, such that $\overline{TB} \perp \overline{CA}$. Which line segment is shortest?
1) $\overline{CT}$
2) $\overline{BC}$
3) $\overline{TB}$
4) $\overline{AT}$

342 In the diagram below, quadrilateral $ABCD$ has vertices $A(-5,1)$, $B(6,-1)$, $C(3,5)$, and $D(-2,7)$.



What are the coordinates of the midpoint of diagonal $\overline{AC}$?
1) $(-1,3)$
2) $(1,3)$
3) $(1,4)$
4) $(2,3)$

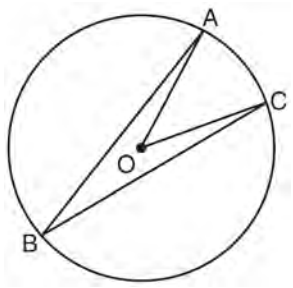
343 What is an equation of the line that passes through $(-9,12)$ and is perpendicular to the line whose equation is $y = \frac{1}{3}x + 6$?

1) $y = \frac{1}{3}x + 15$
2) $y = -3x - 15$
3) $y = \frac{1}{3}x - 13$
4) $y = -3x + 27$

344 The diameter of the base of a right circular cylinder is 6 cm and its height is 15 cm. In square centimeters, the lateral area of the cylinder is

1) 180π
2) 135π
3) 90π
4) 45π

345 In the diagram below of circle O, $m\angle ABC = 24$.



What is the $m\angle AOC$?

1) 12
2) 24
3) 48
4) 60

346 In $\triangle ABC$, an exterior angle at C measures 50°. If $m\angle A > 30$. which inequality must be true?

1) $m\angle B < 20$
2) $m\angle B > 20$
3) $m\angle BCA < 130$
4) $m\angle BCA > 130$

347 Given the statement, "If a number has exactly two factors, it is a prime number," what is the contrapositive of this statement?

1) If a number does not have exactly two factors, then it is not a prime number.
2) If a number is not a prime number, then it does not have exactly two factors.
3) If a number is a prime number, then it has exactly two factors.
4) A number is a prime number if it has exactly two factors.

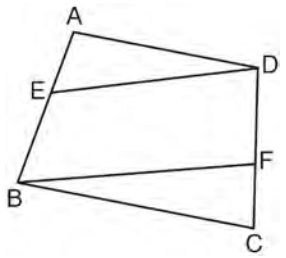
348 Triangle ABC has vertices $A(0,0)$, $B(6,8)$, and $C(8,4)$. Which equation represents the perpendicular bisector of $\overline{BC}$?

1) $y = 2x - 6$
2) $y = -2x + 4$
3) $y = \frac{1}{2}x + \frac{5}{2}$
4) $y = -\frac{1}{2}x + \frac{19}{2}$

349 Which set of numbers could represent the lengths of the sides of a right triangle?

1) $\{2,3,4\}$
2) $\{5,9,13\}$
3) $\{7,7,12\}$
4) $\{8,15,17\}$

350 In the diagram below of quadrilateral *ABCD*, *E* and *F* are points on $\overline{AB}$ and $\overline{CD}$, respectively, $\overline{BE} \cong \overline{DF}$, and $\overline{AE} \cong \overline{CF}$.



Which conclusion can be proven?

1) $\overline{ED} \cong \overline{FB}$
2) $\overline{AB} \cong \overline{CD}$
3) $\angle A \cong \angle C$
4) $\angle AED \cong \angle CFB$

351 Line ℓ passes through the point $(5,3)$ and is parallel to line *k* whose equation is $5x + y = 6$. An equation of line ℓ is

1) $y = \frac{1}{5}x + 2$
2) $y = -5x + 28$
3) $y = \frac{1}{5}x - 2$
4) $y = -5x - 28$

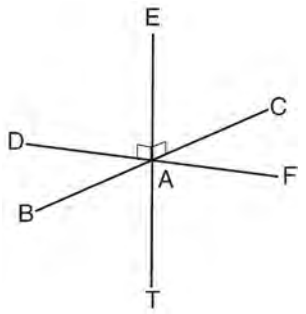
352 The three medians of a triangle intersect at a point. Which measurements could represent the segments of one of the medians?

1) 2 and 3
2) 3 and 4.5
3) 3 and 6
4) 3 and 9

353 A regular polygon has an exterior angle that measures 45°. How many sides does the polygon have?

1) 10
2) 8
3) 6
4) 4

354 As shown in the diagram below, $\overline{FD}$ and $\overline{CB}$ intersect at point *A* and $\overline{ET}$ is perpendicular to both $\overline{FD}$ and $\overline{CB}$ at *A*.



Which statement is *not* true?

1) $\overline{ET}$ is perpendicular to plane *BAD*.
2) $\overline{ET}$ is perpendicular to plane *FAB*.
3) $\overline{ET}$ is perpendicular to plane *CAD*.
4) $\overline{ET}$ is perpendicular to plane *BAT*.

355 In a park, two straight paths intersect. The city wants to install lampposts that are both equidistant from each path and also 15 feet from the intersection of the paths. How many lampposts are needed?

1) 1
2) 2
3) 3
4) 4

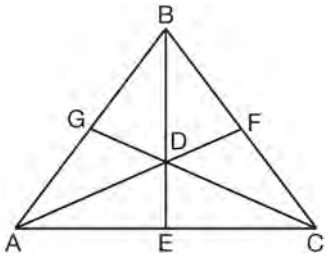
356 If $\triangle MNP \cong \triangle VWX$ and $\overline{PM}$ is the shortest side of $\triangle MNP$, what is the shortest side of $\triangle VWX$?

1) $\overline{XV}$
2) $\overline{WX}$
3) $\overline{VW}$
4) $\overline{NP}$

357 What is the converse of "If an angle measures 90 degrees, then it is a right angle"?

1) If an angle is a right angle, then it measures 90 degrees.
2) An angle is a right angle if it measures 90 degrees.
3) If an angle is not a right angle, then it does not measure 90 degrees.
4) If an angle does not measure 90 degrees, then it is not a right angle.

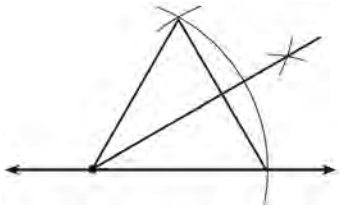
358 As shown below, the medians of $\triangle ABC$ intersect at D.

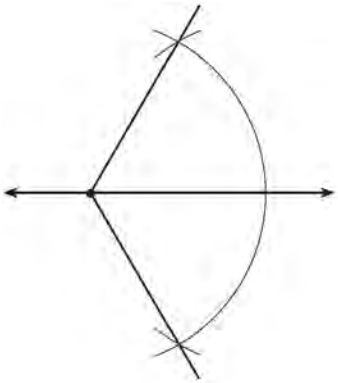


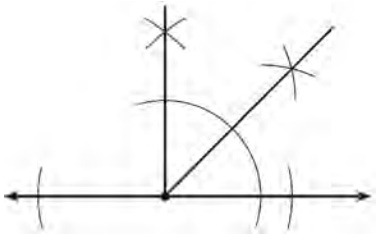
If the length of $\overline{BE}$ is 12, what is the length of $\overline{BD}$?

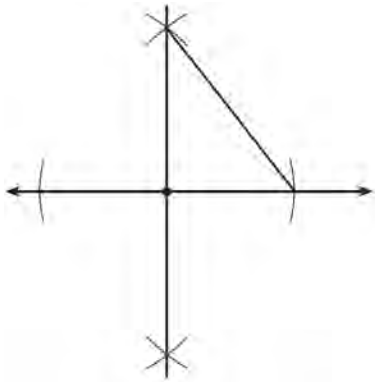
1) 8
2) 9
3) 3
4) 4

359 Which diagram shows the construction of a 45° angle?

1)


2)


3)


4)


360 The equation of a line is $3y + 2x = 12$. What is the slope of the line perpendicular to the given line?

1) $\frac{2}{3}$
2) $\frac{3}{2}$
3) $-\frac{2}{3}$
4) $-\frac{3}{2}$

361 Consider the relationship between the two statements below.

If $\sqrt{16+9} \neq 4+3$, then $5 \neq 4+3$

If $\sqrt{16+9} = 4+3$, then $5 = 4+3$

These statements are

1) inverses
2) converses
3) contrapositives
4) biconditionals

362 What is the slope of a line perpendicular to the line whose equation is $3x - 7y + 14 = 0$?

1) $\frac{3}{7}$
2) $-\frac{7}{3}$
3) 3
4) $-\frac{1}{3}$

363 Students made four statements about a circle.

A: The coordinates of its center are $(4,-3)$.
B: The coordinates of its center are $(-4,3)$.
C: The length of its radius is $5\sqrt{2}$.
D: The length of its radius is 25.

If the equation of the circle is $(x+4)^2 + (y-3)^2 = 50$, which statements are correct?

1) *A* and *C*
2) *A* and *D*
3) *B* and *C*
4) *B* and *D*

364 If $\triangle ABC \cong \triangle JKL \cong \triangle RST$, then $\overline{BC}$ must be congruent to

1) $\overline{JL}$
2) $\overline{JK}$
3) $\overline{ST}$
4) $\overline{RS}$

365 For which measures of the sides of $\triangle ABC$ is angle *B* the largest angle of the triangle?

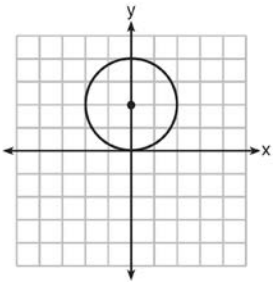
1) $AB = 2, BC = 6, AC = 7$
2) $AB = 6, BC = 12, AC = 8$
3) $AB = 16, BC = 9, AC = 10$
4) $AB = 18, BC = 14, AC = 5$

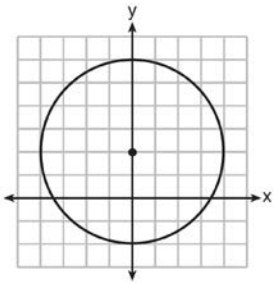
366 How many points in the coordinate plane are 3 units from the origin and also equidistant from both the *x*-axis and the *y*-axis?

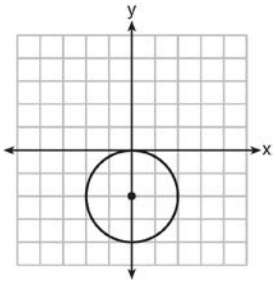
1) 1
2) 2
3) 8
4) 4

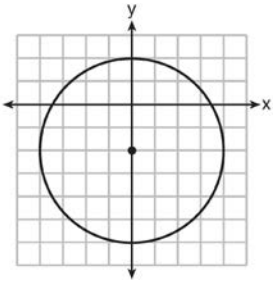
367 What is the measure of the largest exterior angle that any regular polygon can have?
1) 60º
2) 90º
3) 120º
4) 360º

368 Which graph represents a circle whose equation is $x^2 + (y-2)^2 = 4$?

1) 

2) 

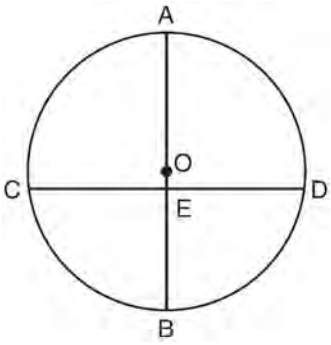
3) 

4) 

369 In the diagram of $\overline{WXYZ}$ below, $\overline{WY} \cong \overline{XZ}$.

Which reasons can be used to prove $\overline{WX} \cong \overline{YZ}$?
1) reflexive property and addition postulate
2) reflexive property and subtraction postulate
3) transitive property and addition postulate
4) transitive property and subtraction postulate

370 In the diagram below of circle O, diameter $\overline{AB}$ and chord $\overline{CD}$ intersect at E.

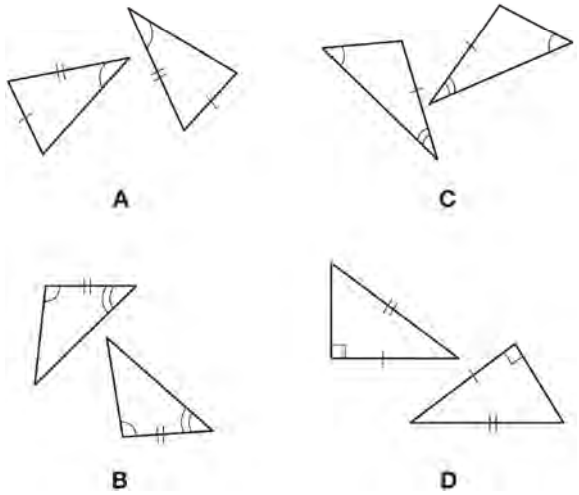


If $\overline{AB} \perp \overline{CD}$, which statement is always true?
1) $\overset{\frown}{AC} \cong \overset{\frown}{BD}$
2) $\overset{\frown}{BD} \cong \overset{\frown}{DA}$
3) $\overset{\frown}{AD} \cong \overset{\frown}{BC}$
4) $\overset{\frown}{CB} \cong \overset{\frown}{BD}$

371 What is the perimeter of a square whose diagonal is $3\sqrt{2}$?
1) 18
2) 12
3) 9
4) 6

372 A regular polygon with an exterior angle of 40° is a
1) pentagon
2) hexagon
3) nonagon
4) decagon

373 In the diagram below, four pairs of triangles are shown. Congruent corresponding parts are labeled in each pair.



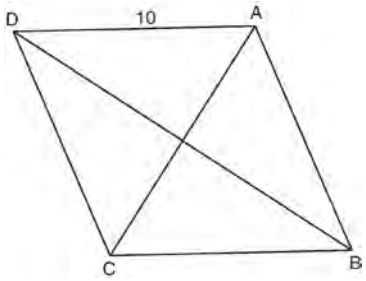
Using only the information given in the diagrams, which pair of triangles can *not* be proven congruent?
1) *A*
2) *B*
3) *C*
4) *D*

374 The corresponding medians of two similar triangles are 8 and 20. If the perimeter of the larger triangle is 45, what is the perimeter of the smaller triangle?
1) 14
2) 18
3) 33
4) 37

375 Point *A* is on line *m*. How many distinct planes will be perpendicular to line *m* and pass through point *A*?
1) one
2) two
3) zero
4) infinite

376 The equation of a circle is $(x-3)^2+y^2=8$. The coordinates of its center and the length of its radius are
1) $(-3,0)$ and 4
2) $(3,0)$ and 4
3) $(-3,0)$ and $2\sqrt{2}$
4) $(3,0)$ and $2\sqrt{2}$

377 In rhombus *ABCD*, with diagonals $\overline{AC}$ and $\overline{DB}$, $AD = 10$.

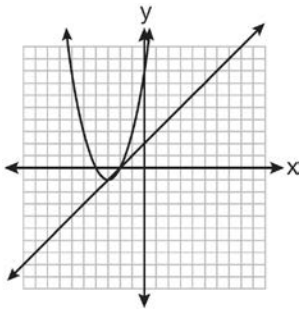


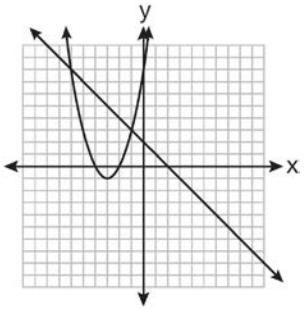
If the length of diagonal $\overline{AC}$ is 12, what is the length of $\overline{DB}$?
1) 8
2) 16
3) $\sqrt{44}$
4) $\sqrt{136}$

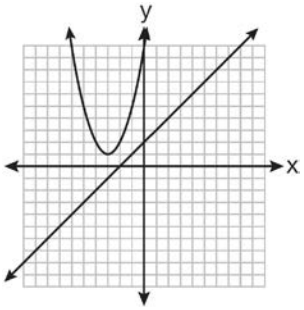
378 Which graph could be used to find the solution to the following system of equations?

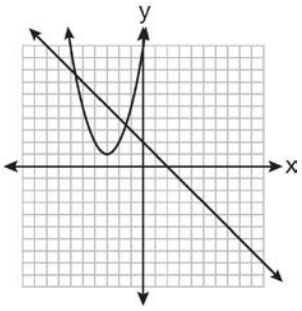
$$y = (x+3)^2 - 1$$

$$x + y = 2$$

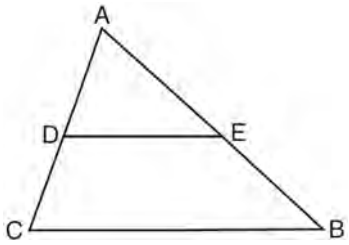
1) 

2) 

3) 

4) 

379 Triangle ABC is shown in the diagram below.



If $\overline{DE}$ joins the midpoints of $\overline{ADC}$ and $\overline{AEB}$, which statement is *not* true?

1) $DE = \frac{1}{2}CB$
2) $\overline{DE} \parallel \overline{CB}$
3) $\frac{AD}{DC} = \frac{DE}{CB}$
4) $\triangle ABC \sim \triangle AED$

380 In parallelogram $JKLM$, $m\angle L$ exceeds $m\angle M$ by 30 degrees. What is the measure of $m\angle J$?

1) 75°
2) 105°
3) 165°
4) 195°

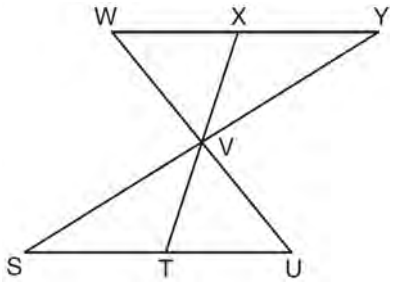
381 What is an equation of the circle with center $(-5, 4)$ and a radius of 7?

1) $(x-5)^2 + (y+4)^2 = 14$
2) $(x-5)^2 + (y+4)^2 = 49$
3) $(x+5)^2 + (y-4)^2 = 14$
4) $(x+5)^2 + (y-4)^2 = 49$

382 In $\triangle ABC$, $m\angle A = 60$, $m\angle B = 80$, and $m\angle C = 40$. Which inequality is true?
1) $AB > BC$
2) $AC > BC$
3) $AC < BA$
4) $BC < BA$

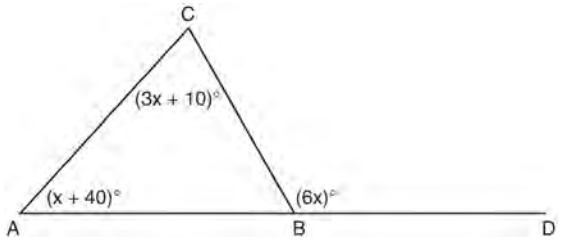
383 If $\triangle ABC \sim \triangle LMN$, which statement is *not* always true?
1) $m\angle A \cong m\angle N$
2) $m\angle B \cong m\angle M$
3) $\frac{\text{area of } \triangle ABC}{\text{area of } \triangle LMN} = \frac{(AC)^2}{(LN)^2}$
4) $\frac{\text{perimeter of } \triangle ABC}{\text{perimeter of } \triangle LMN} = \frac{AB}{LM}$

384 In the diagram below, $\triangle XYV \cong \triangle TSV$.



Which statement can *not* be proven?
1) $\angle XVY \cong \angle TVS$
2) $\angle VYX \cong \angle VUT$
3) $\overline{XY} \cong \overline{TS}$
4) $\overline{YV} \cong \overline{SV}$

385 In the diagram of $\triangle ABC$ below, $\overline{AB}$ is extended to point D.



If $m\angle CAB = x + 40$, $m\angle ACB = 3x + 10$, $m\angle CBD = 6x$, what is $m\angle CAB$?
1) 13
2) 25
3) 53
4) 65

386 Two prisms have equal heights and equal volumes. The base of one is a pentagon and the base of the other is a square. If the area of the pentagonal base is 36 square inches, how many inches are in the length of each side of the square base?
1) 6
2) 9
3) 24
4) 36

387 The equations $x^2 + y^2 = 25$ and $y = 5$ are graphed on a set of axes. What is the solution of this system?
1) $(0,0)$
2) $(5,0)$
3) $(0,5)$
4) $(5,5)$

388 What are the truth values of the statement "Two is prime" and its negation?
1) The statement is false and its negation is true.
2) The statement is false and its negation is false.
3) The statement is true and its negation is true.
4) The statement is true and its negation is false.

389 What is the measure of each interior angle in a regular octagon?
1) 108°
2) 135°
3) 144°
4) 1080°

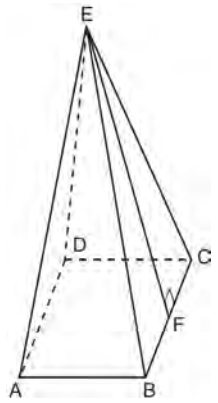
390 What are the coordinates of the center and the length of the radius of the circle whose equation is $(x+1)^2+(y-5)^2=16$?
1) $(1,-5)$ and 16
2) $(-1,5)$ and 16
3) $(1,-5)$ and 4
4) $(-1,5)$ and 4

391 Lines *m* and *n* are in plane $\mathcal{A}$. What is the converse of the statement "If lines *m* and *n* are parallel, then lines *m* and *n* do not intersect"?
1) If lines *m* and *n* are not parallel, then lines *m* and *n* intersect.
2) If lines *m* and *n* are not parallel, then lines *m* and *n* do not intersect
3) If lines *m* and *n* intersect, then lines *m* and *n* are not parallel.
4) If lines *m* and *n* do not intersect, then lines *m* and *n* are parallel.

392 What is the perimeter of a rhombus whose diagonals are 16 and 30?
1) 92
2) 68
3) 60
4) 17

393 What is the equation of a line passing through the point $(4,-1)$ and parallel to the line whose equation is $2y-x=8$?
1) $y=\frac{1}{2}x-3$
2) $y=\frac{1}{2}x-1$
3) $y=-2x+7$
4) $y=-2x+2$

394 As shown in the diagram below, a right pyramid has a square base, *ABCD*, and $\overline{EF}$ is the slant height.



Which statement is *not* true?
1) $\overline{EA}\cong\overline{EC}$
2) $\overline{EB}\cong\overline{EF}$
3) $\triangle AEB\cong\triangle BEC$
4) $\triangle CED$ is isosceles

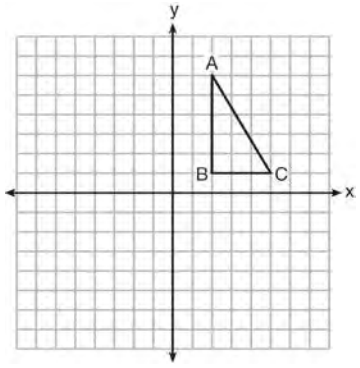
395 Which equation represents the circle whose center is $(-5,3)$ and that passes through the point $(-1,3)$?

1) $(x+1)^2+(y-3)^2=16$
2) $(x-1)^2+(y+3)^2=16$
3) $(x+5)^2+(y-3)^2=16$
4) $(x-5)^2+(y+3)^2=16$

396 The volume of a sphere is approximately 44.6022 cubic centimeters. What is the radius of the sphere, to the *nearest tenth of a centimeter*?

1) 2.2
2) 3.3
3) 4.4
4) 4.7

397 Right triangle *ABC* is shown in the graph below.



After a reflection over the *y*-axis, the image of $\triangle ABC$ is $\triangle A'B'C'$. Which statement is *not* true?

1) $\overline{BC} \cong \overline{B'C'}$
2) $\overline{A'B'} \perp \overline{B'C'}$
3) $AB = A'B'$
4) $\overline{AC} \parallel \overline{A'C'}$

398 What is the solution of the system of equations $y-x=5$ and $y=x^2+5$?

1) $(0,5)$ and $(1,6)$
2) $(0,5)$ and $(-1,6)$
3) $(2,9)$ and $(-1,4)$
4) $(-2,9)$ and $(-1,4)$

399 The midpoint of $\overline{AB}$ is $M(4,2)$. If the coordinates of A are $(6,-4)$, what are the coordinates of B?

1) $(1,-3)$
2) $(2,8)$
3) $(5,-1)$
4) $(14,0)$

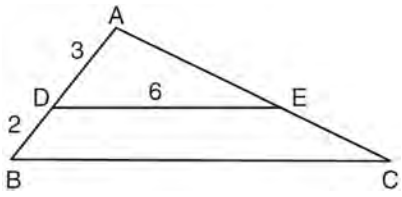
400 Points $A(5,3)$ and $B(7,6)$ lie on $\overleftrightarrow{AB}$. Points $C(6,4)$ and $D(9,0)$ lie on $\overleftrightarrow{CD}$. Which statement is true?

1) $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$
2) $\overleftrightarrow{AB} \perp \overleftrightarrow{CD}$
3) $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ are the same line.
4) $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ intersect, but are not perpendicular.

401 A carpenter made a storage container in the shape of a rectangular prism. It is 5 feet high and has a volume of 720 cubic feet. He wants to make a second container with the same height and volume as the first one, but in the shape of a triangular prism. What will be the number of square feet in the area of the base of the new container?

1) 36
2) 72
3) 144
4) 288

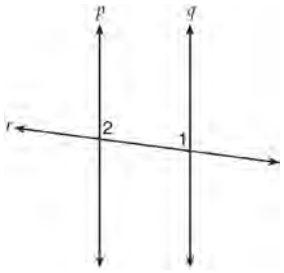
402 In the diagram of $\triangle ABC$ below, $\overline{DE} \parallel \overline{BC}$, $AD = 3$, $DB = 2$, and $DE = 6$.



What is the length of $\overline{BC}$?

1) 12
2) 10
3) 8
4) 4

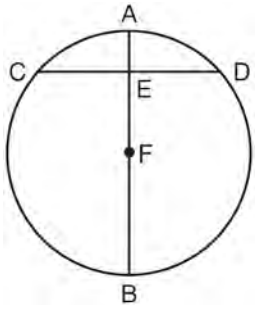
403 Lines p and q are intersected by line r, as shown below.



If $m\angle 1 = 7x - 36$ and $m\angle 2 = 5x + 12$, for which value of x would $p \parallel q$?

1) 17
2) 24
3) 83
4) 97

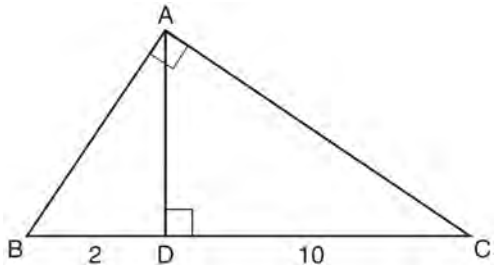
404 In the diagram below, diameter $\overline{AB}$ bisects chord $\overline{CD}$ at point E in circle F.



If $AE = 2$ and $FB = 17$, then the length of $\overline{CE}$ is

1) 7
2) 8
3) 15
4) 16

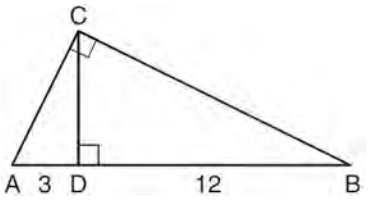
405 Triangle ABC shown below is a right triangle with altitude $\overline{AD}$ drawn to the hypotenuse $\overline{BC}$.



If $BD = 2$ and $DC = 10$, what is the length of $\overline{AB}$?

1) $2\sqrt{2}$
2) $2\sqrt{5}$
3) $2\sqrt{6}$
4) $2\sqrt{30}$

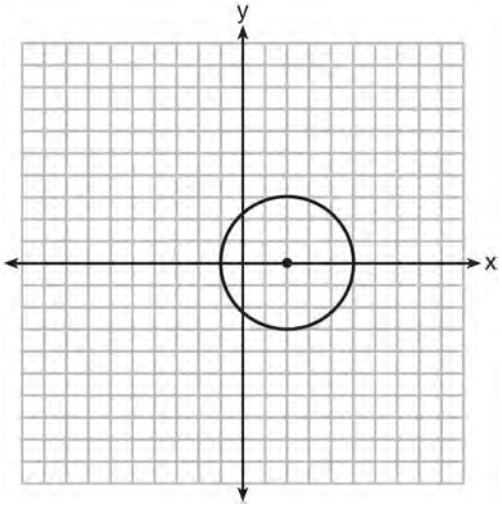
406 In the diagram below of right triangle ABC, altitude $\overline{CD}$ is drawn to hypotenuse $\overline{AB}$.



If $AD = 3$ and $DB = 12$, what is the length of altitude $\overline{CD}$?

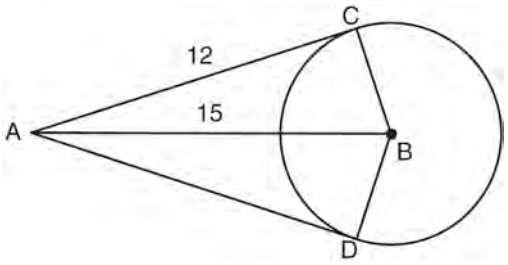
1) 6
2) $6\sqrt{5}$
3) 3
4) $3\sqrt{5}$

407 Which equation represents the circle shown in the graph below?



1) $(x-2)^2+y^2=9$
2) $(x+2)^2+y^2=9$
3) $(x-2)^2+y^2=3$
4) $(x+2)^2+y^2=3$

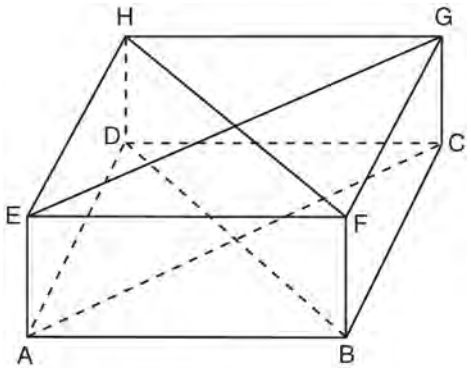
408 In the diagram below, $\overline{AC}$ and $\overline{AD}$ are tangent to circle B at points C and D, respectively, and $\overline{BC}$, $\overline{BD}$, and $\overline{BA}$ are drawn.



If $AC = 12$ and $AB = 15$, what is the length of $\overline{BD}$?

1) 5.5
2) 9
3) 12
4) 18

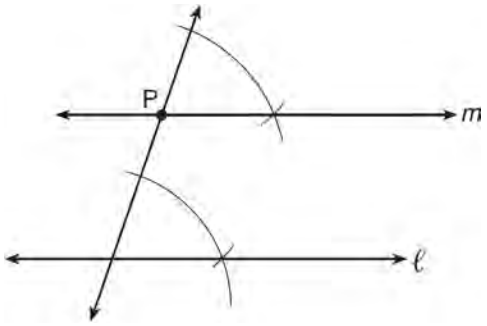
409 A rectangular prism is shown in the diagram below.



Which pair of line segments would always be both congruent and parallel?

1) $\overline{AC}$ and $\overline{FB}$
2) $\overline{FB}$ and $\overline{DB}$
3) $\overline{HF}$ and $\overline{AC}$
4) $\overline{DB}$ and $\overline{HF}$

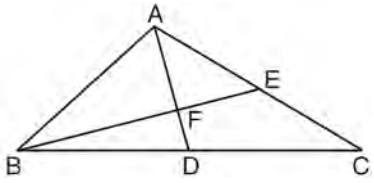
410 The diagram below shows the construction of line m, parallel to line ℓ, through point P.



Which theorem was used to justify this construction?

1) If two lines are cut by a transversal and the alternate interior angles are congruent, the lines are parallel.
2) If two lines are cut by a transversal and the interior angles on the same side are supplementary, the lines are parallel.
3) If two lines are perpendicular to the same line, they are parallel.
4) If two lines are cut by a transversal and the corresponding angles are congruent, they are parallel.

411 In the diagram of $\triangle ABC$ below, medians $\overline{AD}$ and $\overline{BE}$ intersect at point F.



If $AF = 6$, what is the length of $\overline{FD}$?

1) 6
2) 2
3) 3
4) 9

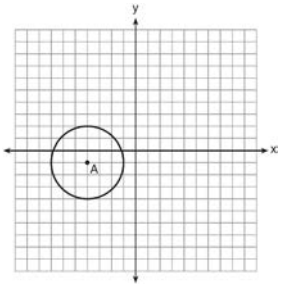
412 The bases of a right triangular prism are $\triangle ABC$ and $\triangle DEF$. Angles A and D are right angles, $AB = 6$, $AC = 8$, and $AD = 12$. What is the length of edge $\overline{BE}$?

1) 10
2) 12
3) 14
4) 16

413 A regular pyramid has a height of 12 centimeters and a square base. If the volume of the pyramid is 256 cubic centimeters, how many centimeters are in the length of one side of its base?

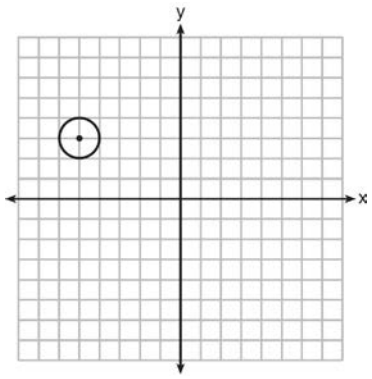
1) 8
2) 16
3) 32
4) 64

414 Which equation represents circle A shown in the diagram below?



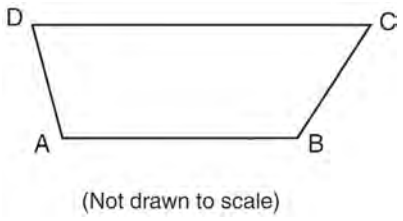
1) $(x-4)^2+(y-1)^2=3$
2) $(x+4)^2+(y+1)^2=3$
3) $(x-4)^2+(y-1)^2=9$
4) $(x+4)^2+(y+1)^2=9$

415 Which equation represents the circle shown in the graph below?



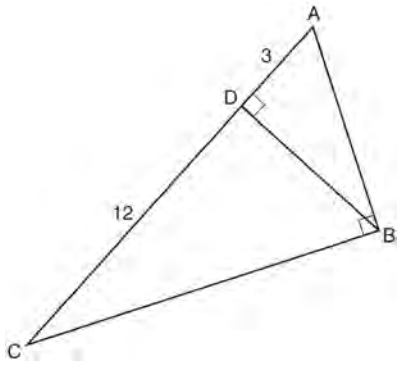
1) $(x-5)^2+(y+3)^2=1$
2) $(x+5)^2+(y-3)^2=1$
3) $(x-5)^2+(y+3)^2=2$
4) $(x+5)^2+(y-3)^2=2$

416 In the diagram below, $\overline{AB}$ and $\overline{CD}$ are bases of trapezoid $ABCD$.



If $m\angle B = 123$ and $m\angle D = 75$, what is $m\angle C$?
1) 57
2) 75
3) 105
4) 123

417 In right triangle ABC shown in the diagram below, altitude $\overline{BD}$ is drawn to hypotenuse $\overline{AC}$, $CD = 12$, and $AD = 3$.



What is the length of $\overline{AB}$?
1) $5\sqrt{3}$
2) 6
3) $3\sqrt{5}$
4) 9

418 If $\triangle ABC$ and its image, $\triangle A'B'C'$, are graphed on a set of axes, $\triangle ABC \cong \triangle A'B'C'$ under each transformation *except*
1) D_2
2) $R_{90°}$
3) $r_{y=x}$
4) $T_{(-2,3)}$

419 A student wrote the following equations:

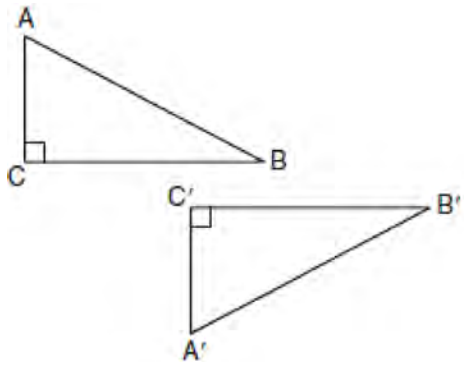
$$3y + 6 = 2x$$

$$2y - 3x = 6$$

The lines represented by these equations are
1) parallel
2) the same line
3) perpendicular
4) intersecting, but *not* perpendicular

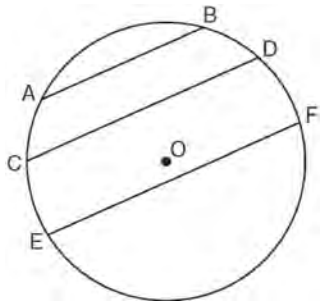
Geometry Multiple Choice Regents Exam Questions

420 In the diagram below, which transformation was used to map $\triangle ABC$ to $\triangle A'B'C'$?



1) dilation
2) rotation
3) reflection
4) glide reflection

421 In the diagram below of circle O, chord $\overline{AB} \parallel$ chord $\overline{CD}$, and chord $\overline{CD} \parallel$ chord $\overline{EF}$.



Which statement must be true?

1) $\overset{\frown}{CE} \cong \overset{\frown}{DF}$
2) $\overset{\frown}{AC} \cong \overset{\frown}{DF}$
3) $\overset{\frown}{AC} \cong \overset{\frown}{CE}$
4) $\overset{\frown}{EF} \cong \overset{\frown}{CD}$

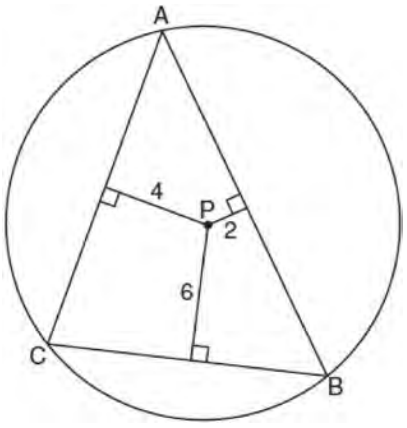
422 A transversal intersects two lines. Which condition would always make the two lines parallel?

1) Vertical angles are congruent.
2) Alternate interior angles are congruent.
3) Corresponding angles are supplementary.
4) Same-side interior angles are complementary.

423 Which transformation is *not* always an isometry?

1) rotation
2) dilation
3) reflection
4) translation

424 In the diagram below, $\triangle ABC$ is inscribed in circle P. The distances from the center of circle P to each side of the triangle are shown.



Which statement about the sides of the triangle is true?

1) $AB > AC > BC$
2) $AB < AC$ and $AC > BC$
3) $AC > AB > BC$
4) $AC = AB$ and $AB > BC$

425 The endpoints of $\overline{CD}$ are $C(-2,-4)$ and $D(6,2)$. What are the coordinates of the midpoint of $\overline{CD}$?

1) $(2,3)$
2) $(2,-1)$
3) $(4,-2)$
4) $(4,3)$

426 If the surface area of a sphere is represented by 144π, what is the volume in terms of π?

1) 36π
2) 48π
3) 216π
4) 288π

427 Given the equations: $y = x^2 - 6x + 10$

$$y + x = 4$$

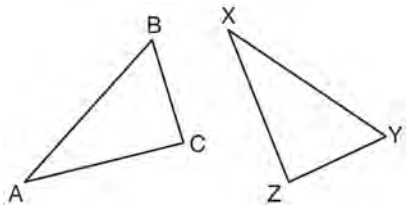
What is the solution to the given system of equations?

1) $(2,3)$
2) $(3,2)$
3) $(2,2)$ and $(1,3)$
4) $(2,2)$ and $(3,1)$

428 What is an equation of the line that contains the point $(3,-1)$ and is perpendicular to the line whose equation is $y = -3x + 2$?

1) $y = -3x + 8$
2) $y = -3x$
3) $y = \frac{1}{3}x$
4) $y = \frac{1}{3}x - 2$

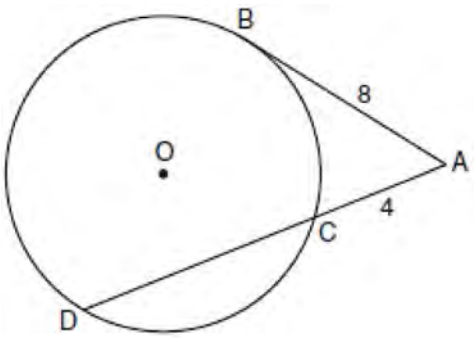
429 In the diagram below, $\triangle ABC \cong \triangle XYZ$.



Which two statements identify corresponding congruent parts for these triangles?

1) $\overline{AB} \cong \overline{XY}$ and $\angle C \cong \angle Y$
2) $\overline{AB} \cong \overline{YZ}$ and $\angle C \cong \angle X$
3) $\overline{BC} \cong \overline{XY}$ and $\angle A \cong \angle Y$
4) $\overline{BC} \cong \overline{YZ}$ and $\angle A \cong \angle X$

430 In the diagram below, tangent $\overline{AB}$ and secant $\overline{ACD}$ are drawn to circle O from an external point A, $AB = 8$, and $AC = 4$.



What is the length of $\overline{CD}$?

1) 16
2) 13
3) 12
4) 10

431 What are the center and the radius of the circle whose equation is $(x-3)^2+(y+3)^2=36$

1) center = $(3,-3)$; radius = 6
2) center = $(-3,3)$; radius = 6
3) center = $(3,-3)$; radius = 36
4) center = $(-3,3)$; radius = 36

432 In $\triangle ABC$, $\overline{AB} \cong \overline{BC}$. An altitude is drawn from B to $\overline{AC}$ and intersects $\overline{AC}$ at D. Which conclusion is *not* always true?

1) $\angle ABD \cong \angle CBD$
2) $\angle BDA \cong \angle BDC$
3) $\overline{AD} \cong \overline{BD}$
4) $\overline{AD} \cong \overline{DC}$

433 What is the negation of the statement "I am not going to eat ice cream"?

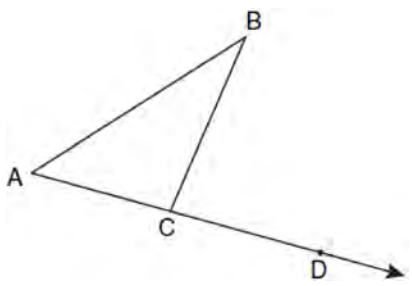
1) I like ice cream.
2) I am going to eat ice cream.
3) If I eat ice cream, then I like ice cream.
4) If I don't like ice cream, then I don't eat ice cream.

434 What is the solution of the following system of equations?

$$y=(x+3)^2-4$$
$$y=2x+5$$

1) $(0,-4)$
2) $(-4,0)$
3) $(-4,-3)$ and $(0,5)$
4) $(-3,-4)$ and $(5,0)$

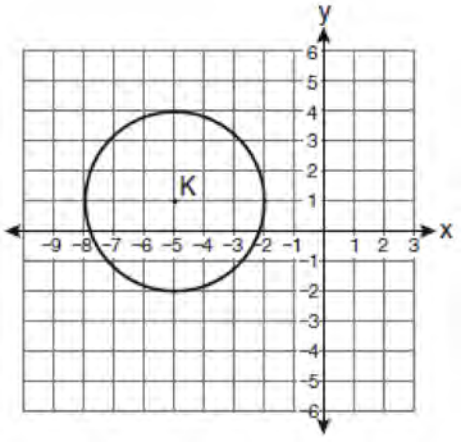
435 In the diagram below, $\triangle ABC$ is shown with $\overline{AC}$ extended through point D.



If $m\angle BCD = 6x+2$, $m\angle BAC = 3x+15$, and $m\angle ABC = 2x-1$, what is the value of x?

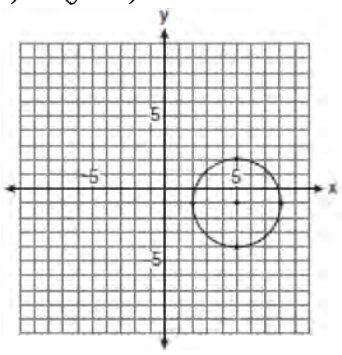
1) 12
2) $14\frac{10}{11}$
3) 16
4) $18\frac{1}{9}$

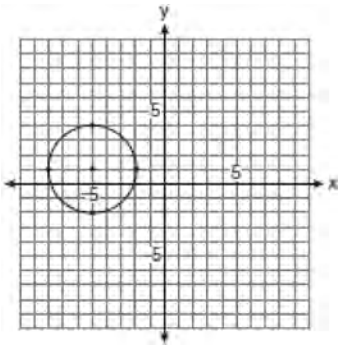
436 Which equation represents circle K shown in the graph below?

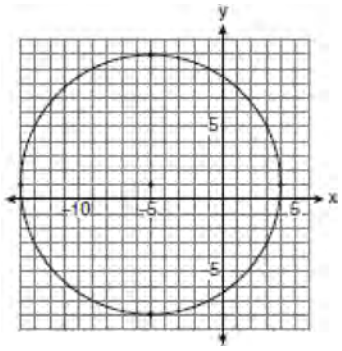


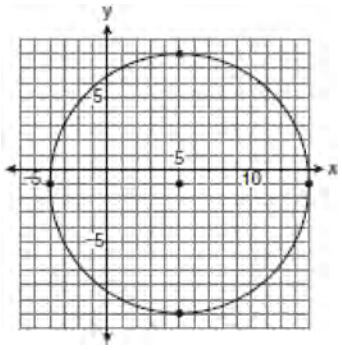
1) $(x+5)^2+(y-1)^2=3$
2) $(x+5)^2+(y-1)^2=9$
3) $(x-5)^2+(y+1)^2=3$
4) $(x-5)^2+(y+1)^2=9$

437 Which graph represents a circle with the equation $(x-5)^2+(y+1)^2=9$?

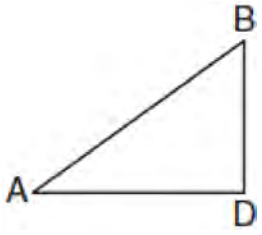
1) 

2) 

3) 

4) 

438 In the diagram below of $\triangle ADB$, $m\angle BDA = 90$, $AD = 5\sqrt{2}$, and $AB = 2\sqrt{15}$.



What is the length of $\overline{BD}$?

1) $\sqrt{10}$
2) $\sqrt{20}$
3) $\sqrt{50}$
4) $\sqrt{110}$

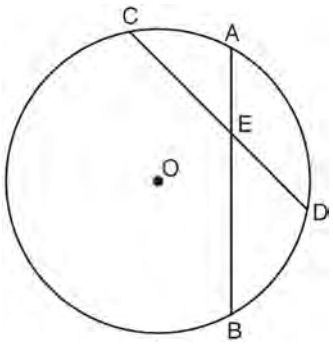
439 Which transformation of the line $x = 3$ results in an image that is perpendicular to the given line?

1) $r_{x\text{-axis}}$
2) $r_{y\text{-axis}}$
3) $r_{y=x}$
4) $r_{x=1}$

440 What is the slope of a line perpendicular to the line whose equation is $2y = -6x + 8$?

1) -3
2) $\frac{1}{6}$
3) $\frac{1}{3}$
4) -6

441 In the diagram below of circle O, chords $\overline{AB}$ and $\overline{CD}$ intersect at E.



If $CE = 10$, $ED = 6$, and $AE = 4$, what is the length of $\overline{EB}$?

1) 15
2) 12
3) 6.7
4) 2.4

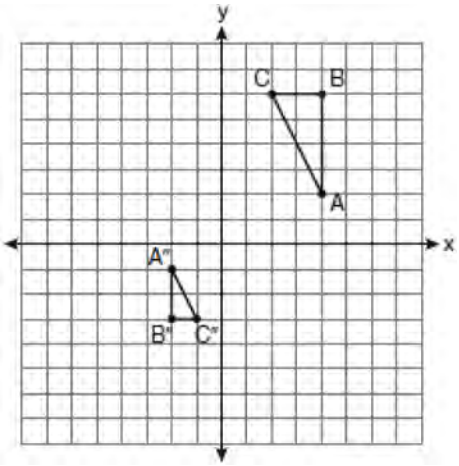
442 A transformation of a polygon that always preserves both length and orientation is

1) dilation
2) translation
3) line reflection
4) glide reflection

443 Line k is drawn so that it is perpendicular to two distinct planes, P and R. What must be true about planes P and R?

1) Planes P and R are skew.
2) Planes P and R are parallel.
3) Planes P and R are perpendicular.
4) Plane P intersects plane R but is not perpendicular to plane R.

444 After a composition of transformations, the coordinates $A(4,2)$, $B(4,6)$, and $C(2,6)$ become $A''(-2,-1)$, $B''(-2,-3)$, and $C''(-1,-3)$, as shown on the set of axes below.



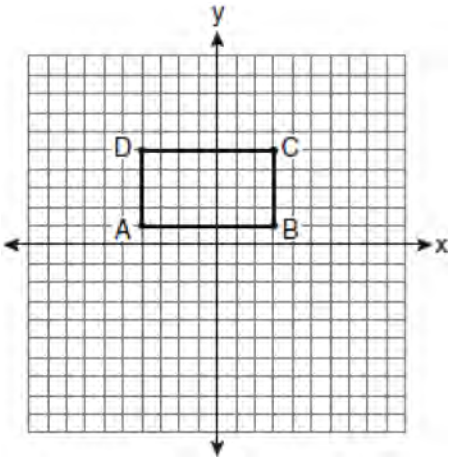
Which composition of transformations was used?

1) $R_{180^\circ} \circ D_2$
2) $R_{90^\circ} \circ D_2$
3) $D_{\frac{1}{2}} \circ R_{180^\circ}$
4) $D_{\frac{1}{2}} \circ R_{90^\circ}$

445 Two lines are represented by the equations $-\frac{1}{2}y = 6x + 10$ and $y = mx$. For which value of m will the lines be parallel?

1) –12
2) –3
3) 3
4) 12

446 On the set of axes below, Geoff drew rectangle *ABCD*. He will transform the rectangle by using the translation $(x,y) \rightarrow (x+2, y+1)$ and then will reflect the translated rectangle over the *x*-axis.



What will be the area of the rectangle after these transformations?

1) exactly 28 square units
2) less than 28 square units
3) greater than 28 square units
4) It cannot be determined from the information given.

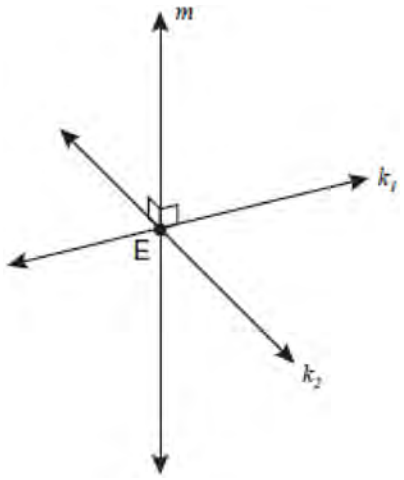
447 If two different lines are perpendicular to the same plane, they are

1) collinear
2) coplanar
3) congruent
4) consecutive

448 Side $\overline{PQ}$ of $\triangle PQR$ is extended through Q to point T. Which statement is *not* always true?

1) $m\angle RQT > m\angle R$
2) $m\angle RQT > m\angle P$
3) $m\angle RQT = m\angle P + m\angle R$
4) $m\angle RQT > m\angle PQR$

449 Lines k_1 and k_2 intersect at point *E*. Line *m* is perpendicular to lines k_1 and k_2 at point *E*.



Which statement is always true?

1) Lines k_1 and k_2 are perpendicular.
2) Line *m* is parallel to the plane determined by lines k_1 and k_2.
3) Line *m* is perpendicular to the plane determined by lines k_1 and k_2.
4) Line *m* is coplanar with lines k_1 and k_2.

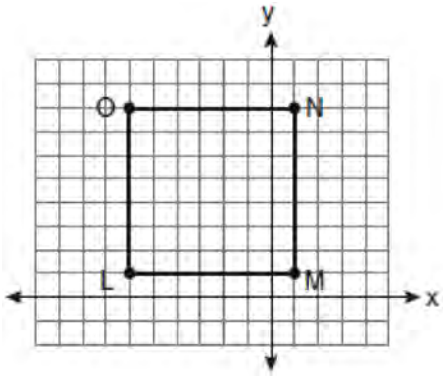
450 In $\triangle ABC$, $m\angle A = x$, $m\angle B = 2x + 2$, and $m\angle C = 3x + 4$. What is the value of *x*?

1) 29
2) 31
3) 59
4) 61

451 Which equation represents a line perpendicular to the line whose equation is $2x + 3y = 12$?

1) $6y = -4x + 12$
2) $2y = 3x + 6$
3) $2y = -3x + 6$
4) $3y = -2x + 12$

452 Square $LMNO$ is shown in the diagram below.



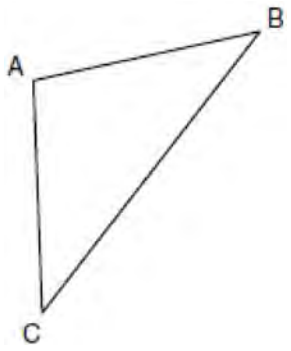
What are the coordinates of the midpoint of diagonal $\overline{LN}$?

1) $\left(4\frac{1}{2}, -2\frac{1}{2}\right)$
2) $\left(-3\frac{1}{2}, 3\frac{1}{2}\right)$
3) $\left(-2\frac{1}{2}, 3\frac{1}{2}\right)$
4) $\left(-2\frac{1}{2}, 4\frac{1}{2}\right)$

453 $\triangle ABC$ is similar to $\triangle DEF$. The ratio of the length of $\overline{AB}$ to the length of $\overline{DE}$ is 3:1. Which ratio is also equal to 3:1?

1) $\frac{m\angle A}{m\angle D}$
2) $\frac{m\angle B}{m\angle F}$
3) $\frac{\text{area of } \triangle ABC}{\text{area of } \triangle DEF}$
4) $\frac{\text{perimeter of } \triangle ABC}{\text{perimeter of } \triangle DEF}$

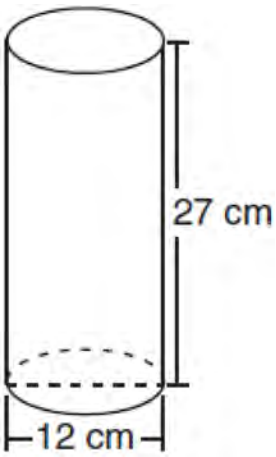
454 In the diagram of $\triangle ABC$ below, $\overline{AB} \cong \overline{AC}$. The measure of $\angle B$ is 40°.



What is the measure of $\angle A$?

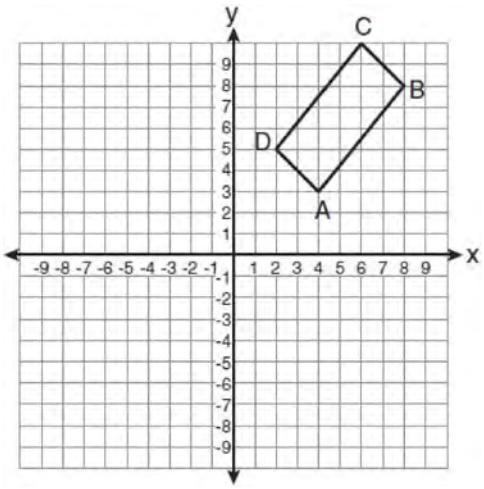
1) 40°
2) 50°
3) 70°
4) 100°

455 Which expression represents the volume, in cubic centimeters, of the cylinder represented in the diagram below?



1) 162π
2) 324π
3) 972π
4) $3,888\pi$

456 The rectangle *ABCD* shown in the diagram below will be reflected across the *x*-axis.



What will *not* be preserved?

1) slope of $\overline{AB}$
2) parallelism of $\overline{AB}$ and $\overline{CD}$
3) length of $\overline{AB}$
4) measure of $\angle A$

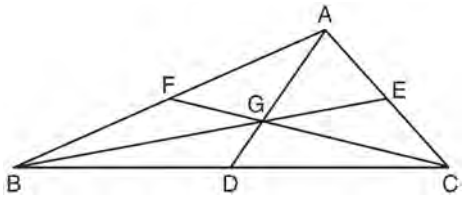
457 Juliann plans on drawing $\triangle ABC$, where the measure of $\angle A$ can range from 50° to 60° and the measure of $\angle B$ can range from 90° to 100°. Given these conditions, what is the correct range of measures possible for $\angle C$?

1) 20° to 40°
2) 30° to 50°
3) 80° to 90°
4) 120° to 130°

458 In $\triangle PQR$, $PQ = 8$, $QR = 12$, and $RP = 13$. Which statement about the angles of $\triangle PQR$ must be true?

1) $m\angle Q > m\angle P > m\angle R$
2) $m\angle Q > m\angle R > m\angle P$
3) $m\angle R > m\angle P > m\angle Q$
4) $m\angle P > m\angle R > m\angle Q$

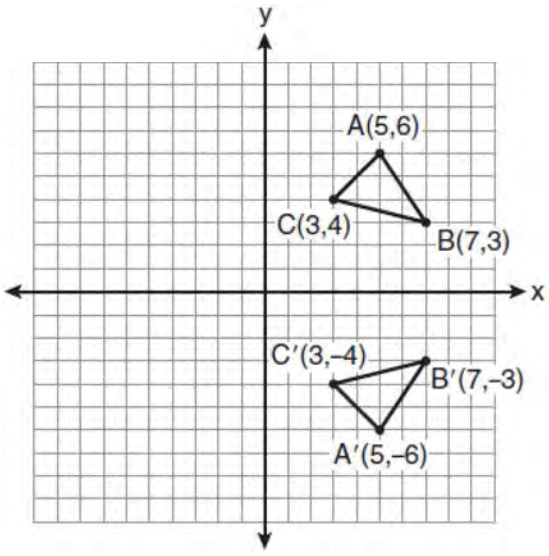
459 In the diagram below of $\triangle ABC$, medians $\overline{AD}$, $\overline{BE}$, and $\overline{CF}$ intersect at *G*.



If $CF = 24$, what is the length of $\overline{FG}$?

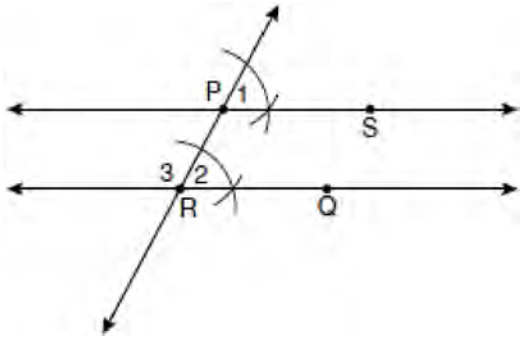
1) 8
2) 10
3) 12
4) 16

460 Which expression best describes the transformation shown in the diagram below?



1) same orientation; reflection
2) opposite orientation; reflection
3) same orientation; translation
4) opposite orientation; translation

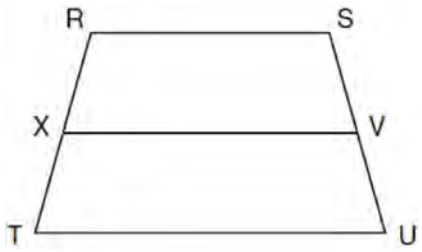
461 The diagram below illustrates the construction of $\overleftrightarrow{PS}$ parallel to $\overleftrightarrow{RQ}$ through point P.



Which statement justifies this construction?

1) $m\angle 1 = m\angle 2$
2) $m\angle 1 = m\angle 3$
3) $\overline{PR} \cong \overline{RQ}$
4) $\overline{PS} \cong \overline{RQ}$

462 In the diagram below of trapezoid $RSUT$, $\overline{RS} \parallel \overline{TU}$, X is the midpoint of $\overline{RT}$, and V is the midpoint of $\overline{SU}$.



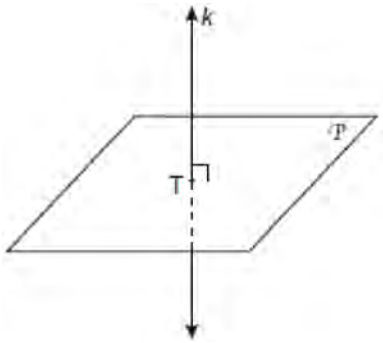
If $RS = 30$ and $XV = 44$, what is the length of $\overline{TU}$?

1) 37
2) 58
3) 74
4) 118

463 The lines $3y + 1 = 6x + 4$ and $2y + 1 = x - 9$ are

1) parallel
2) perpendicular
3) the same line
4) neither parallel nor perpendicular

464 In the diagram below, line k is perpendicular to plane $\mathcal{P}$ at point T.



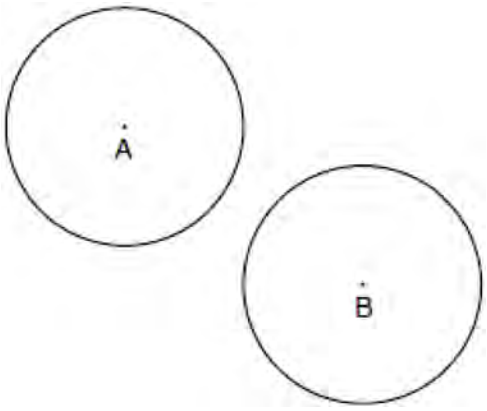
Which statement is true?

1) Any point in plane $\mathcal{P}$ also will be on line k.
2) Only one line in plane $\mathcal{P}$ will intersect line k.
3) All planes that intersect plane $\mathcal{P}$ will pass through T.
4) Any plane containing line k is perpendicular to plane $\mathcal{P}$.

465 Isosceles trapezoid $ABCD$ has diagonals $\overline{AC}$ and $\overline{BD}$. If $AC = 5x + 13$ and $BD = 11x - 5$, what is the value of x?

1) 28
2) $10\frac{3}{4}$
3) 3
4) $\frac{1}{2}$

466 In the diagram below, circle *A* and circle *B* are shown.



What is the total number of lines of tangency that are common to circle *A* and circle *B*?

1) 1
2) 2
3) 3
4) 4

467 What is the slope of a line perpendicular to the line whose equation is $y = -\frac{2}{3}x - 5$?

1) $-\frac{3}{2}$
2) $-\frac{2}{3}$
3) $\frac{2}{3}$
4) $\frac{3}{2}$

468 Line segment *AB* is tangent to circle *O* at *A*. Which type of triangle is always formed when points *A*, *B*, and *O* are connected?

1) right
2) obtuse
3) scalene
4) isosceles

469 The vertices of $\triangle ABC$ are $A(-1,-2)$, $B(-1,2)$ and $C(6,0)$. Which conclusion can be made about the angles of $\triangle ABC$?

1) $m\angle A = m\angle B$
2) $m\angle A = m\angle C$
3) $m\angle ACB = 90$
4) $m\angle ABC = 60$

470 What is the slope of a line perpendicular to the line whose equation is $y = 3x + 4$?

1) $\frac{1}{3}$
2) $-\frac{1}{3}$
3) 3
4) –3

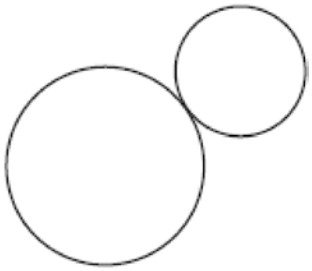
471 Tangents $\overline{PA}$ and $\overline{PB}$ are drawn to circle *O* from an external point, *P*, and radii $\overline{OA}$ and $\overline{OB}$ are drawn. If $m\angle APB = 40$, what is the measure of $\angle AOB$?

1) 140°
2) 100°
3) 70°
4) 50°

472 What is the converse of the statement "If Bob does his homework, then George gets candy"?

1) If George gets candy, then Bob does his homework.
2) Bob does his homework if and only if George gets candy.
3) If George does not get candy, then Bob does not do his homework.
4) If Bob does not do his homework, then George does not get candy.

473 How many common tangent lines can be drawn to the two externally tangent circles shown below?



1) 1
2) 2
3) 3
4) 4

474 Given: $y = \frac{1}{4}x - 3$

$y = x^2 + 8x + 12$

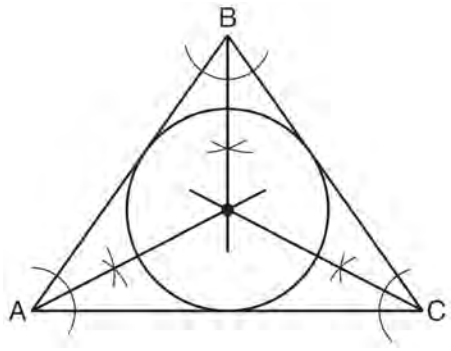
In which quadrant will the graphs of the given equations intersect?

1) I
2) II
3) III
4) IV

475 The endpoints of $\overline{AB}$ are $A(3,2)$ and $B(7,1)$. If $\overline{A''B''}$ is the result of the transformation of $\overline{AB}$ under $D_2 \circ T_{-4,3}$ what are the coordinates of A'' and B''?

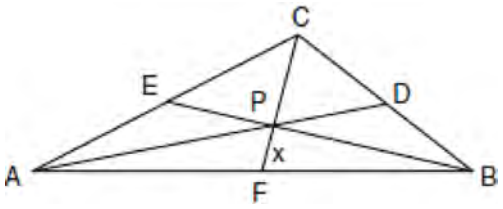
1) $A''(-2,10)$ and $B''(6,8)$
2) $A''(-1,5)$ and $B''(3,4)$
3) $A''(2,7)$ and $B''(10,5)$
4) $A''(14,-2)$ and $B''(22,-4)$

476 Which geometric principle is used in the construction shown below?



1) The intersection of the angle bisectors of a triangle is the center of the inscribed circle.
2) The intersection of the angle bisectors of a triangle is the center of the circumscribed circle.
3) The intersection of the perpendicular bisectors of the sides of a triangle is the center of the inscribed circle.
4) The intersection of the perpendicular bisectors of the sides of a triangle is the center of the circumscribed circle.

477 In the diagram of $\triangle ABC$ below, Jose found centroid P by constructing the three medians. He measured $\overline{CF}$ and found it to be 6 inches.



If $PF = x$, which equation can be used to find x?

1) $x + x = 6$
2) $2x + x = 6$
3) $3x + 2x = 6$
4) $x + \frac{2}{3}x = 6$

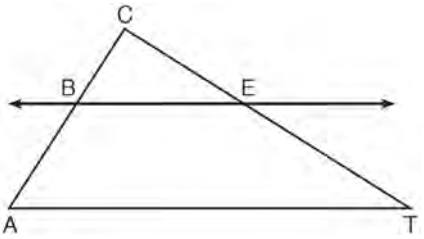
478 What is the slope of a line that is perpendicular to the line whose equation is $3x + 4y = 12$?

1) $\frac{3}{4}$
2) $-\frac{3}{4}$
3) $\frac{4}{3}$
4) $-\frac{4}{3}$

479 Two triangles are similar, and the ratio of each pair of corresponding sides is 2:1. Which statement regarding the two triangles is *not* true?

1) Their areas have a ratio of 4:1.
2) Their altitudes have a ratio of 2:1.
3) Their perimeters have a ratio of 2:1.
4) Their corresponding angles have a ratio of 2:1.

480 In the diagram below of $\triangle ACT$, $\overleftrightarrow{BE} \parallel \overline{AT}$.

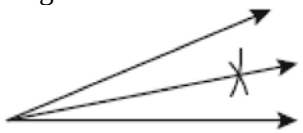


If $CB = 3$, $CA = 10$, and $CE = 6$, what is the length of $\overline{ET}$?

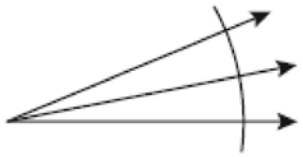
1) 5
2) 14
3) 20
4) 26

481 Which illustration shows the correct construction of an angle bisector?

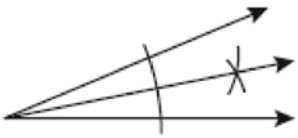
1)



2)

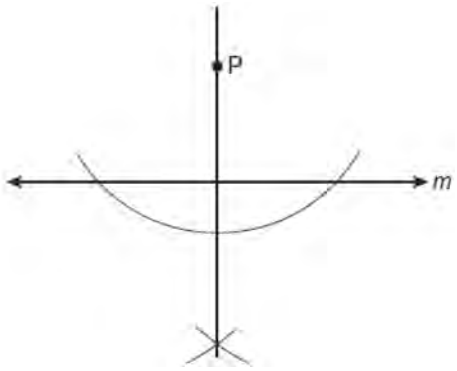


3)



4)

482 The diagram below shows the construction of a line through point *P* perpendicular to line *m*.



Which statement is demonstrated by this construction?

1) If a line is parallel to a line that is perpendicular to a third line, then the line is also perpendicular to the third line.
2) The set of points equidistant from the endpoints of a line segment is the perpendicular bisector of the segment.
3) Two lines are perpendicular if they are equidistant from a given point.
4) Two lines are perpendicular if they intersect to form a vertical line.

483 Which transformation can map the letter **S** onto itself?

1) glide reflection
2) translation
3) line reflection
4) rotation

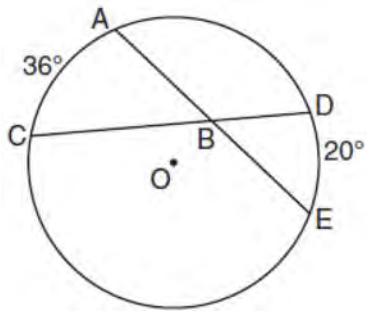
484 What is the length of the line segment with endpoints $(-6,4)$ and $(2,-5)$?

1) $\sqrt{13}$
2) $\sqrt{17}$
3) $\sqrt{72}$
4) $\sqrt{145}$

485 What is an equation of the line that passes through the point $(-2,5)$ and is perpendicular to the line whose equation is $y = \frac{1}{2}x + 5$?

1) $y = 2x + 1$
2) $y = -2x + 1$
3) $y = 2x + 9$
4) $y = -2x - 9$

486 In the diagram below of circle *O*, chords $\overline{AE}$ and $\overline{DC}$ intersect at point *B*, such that $m\overset{\frown}{AC} = 36$ and $m\overset{\frown}{DE} = 20$.

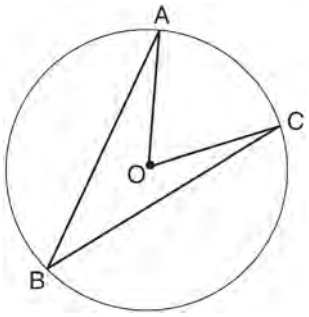


What is $m\angle ABC$?

1) 56
2) 36
3) 28
4) 8

487 If $\triangle ABC \sim \triangle ZXY$, $m\angle A = 50$, and $m\angle C = 30$, what is $m\angle X$?
1) 30
2) 50
3) 80
4) 100

488 Circle O with $\angle AOC$ and $\angle ABC$ is shown in the diagram below.



What is the ratio of $m\angle AOC$ to $m\angle ABC$?
1) 1 : 1
2) 2 : 1
3) 3 : 1
4) 1 : 2

489 Towns A and B are 16 miles apart. How many points are 10 miles from town A and 12 miles from town B?
1) 1
2) 2
3) 3
4) 0

490 What is the equation of a line that is parallel to the line whose equation is $y = x + 2$?
1) $x + y = 5$
2) $2x + y = -2$
3) $y - x = -1$
4) $y - 2x = 3$

491 In which polygon does the sum of the measures of the interior angles equal the sum of the measures of the exterior angles?
1) triangle
2) hexagon
3) octagon
4) quadrilateral

492 In an equilateral triangle, what is the difference between the sum of the exterior angles and the sum of the interior angles?
1) 180°
2) 120°
3) 90°
4) 60°

493 If the diagonals of a quadrilateral do *not* bisect each other, then the quadrilateral could be a
1) rectangle
2) rhombus
3) square
4) trapezoid

494 The equation of a circle is $x^2 + (y-7)^2 = 16$. What are the center and radius of the circle?
1) center = $(0,7)$; radius = 4
2) center = $(0,7)$; radius = 16
3) center = $(0,-7)$; radius = 4
4) center = $(0,-7)$; radius = 16

495 If the endpoints of $\overline{AB}$ are $A(-4,5)$ and $B(2,-5)$, what is the length of $\overline{AB}$?
1) $2\sqrt{34}$
2) 2
3) $\sqrt{61}$
4) 8

496 Point A is located at $(4,-7)$. The point is reflected in the x-axis. Its image is located at
1) $(-4,7)$
2) $(-4,-7)$
3) $(4,7)$
4) $(7,-4)$

497 What is the contrapositive of the statement, "If I am tall, then I will bump my head"?
1) If I bump my head, then I am tall.
2) If I do not bump my head, then I am tall.
3) If I am tall, then I will not bump my head.
4) If I do not bump my head, then I am not tall.

498 The coordinates of the vertices of parallelogram $ABCD$ are $A(-3,2)$, $B(-2,-1)$, $C(4,1)$, and $D(3,4)$. The slopes of which line segments could be calculated to show that $ABCD$ is a rectangle?
1) $\overline{AB}$ and $\overline{DC}$
2) $\overline{AB}$ and $\overline{BC}$
3) $\overline{AD}$ and $\overline{BC}$
4) $\overline{AC}$ and $\overline{BD}$

499 What is the length, to the *nearest tenth*, of the line segment joining the points $(-4,2)$ and $(146,52)$?
1) 141.4
2) 150.5
3) 151.9
4) 158.1

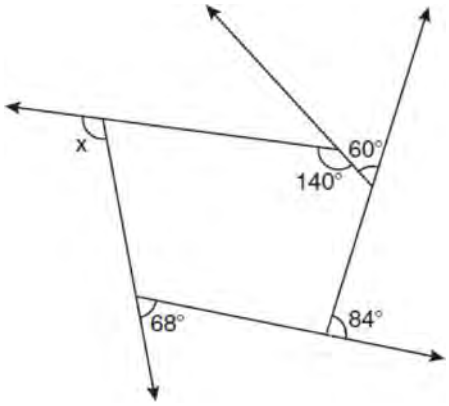
500 Given the system of equations: $y = x^2 - 4x$
$x = 4$
The number of points of intersection is
1) 1
2) 2
3) 3
4) 0

501 A right circular cylinder has an altitude of 11 feet and a radius of 5 feet. What is the lateral area, in square feet, of the cylinder, to the *nearest tenth*?
1) 172.7
2) 172.8
3) 345.4
4) 345.6

502 Given $\triangle ABC \sim \triangle DEF$ such that $\frac{AB}{DE} = \frac{3}{2}$. Which statement is *not* true?

1) $\frac{BC}{EF} = \frac{3}{2}$
2) $\frac{m\angle A}{m\angle D} = \frac{3}{2}$
3) $\frac{\text{area of } \triangle ABC}{\text{area of } \triangle DEF} = \frac{9}{4}$
4) $\frac{\text{perimeter of } \triangle ABC}{\text{perimeter of } \triangle DEF} = \frac{3}{2}$

503 The pentagon in the diagram below is formed by five rays.



What is the degree measure of angle x?

1) 72
2) 96
3) 108
4) 112

504 In three-dimensional space, two planes are parallel and a third plane intersects both of the parallel planes. The intersection of the planes is a

1) plane
2) point
3) pair of parallel lines
4) pair of intersecting lines

505 In $\triangle ABC$, point D is on $\overline{AB}$, and point E is on $\overline{BC}$ such that $\overline{DE} \parallel \overline{AC}$. If $DB = 2$, $DA = 7$, and $DE = 3$, what is the length of $\overline{AC}$?

1) 8
2) 9
3) 10.5
4) 13.5

506 What is an equation of a circle with its center at $(-3,5)$ and a radius of 4?

1) $(x-3)^2 + (y+5)^2 = 16$
2) $(x+3)^2 + (y-5)^2 = 16$
3) $(x-3)^2 + (y+5)^2 = 4$
4) $(x+3)^2 + (y-5)^2 = 4$

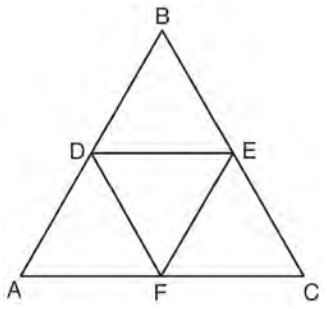
507 Lines j and k intersect at point P. Line m is drawn so that it is perpendicular to lines j and k at point P. Which statement is correct?

1) Lines j and k are in perpendicular planes.
2) Line m is in the same plane as lines j and k.
3) Line m is parallel to the plane containing lines j and k.
4) Line m is perpendicular to the plane containing lines j and k.

508 What is an equation of the line that passes through the point $(7,3)$ and is parallel to the line $4x + 2y = 10$?

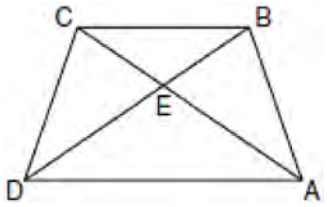
1) $y = \frac{1}{2}x - \frac{1}{2}$
2) $y = -\frac{1}{2}x + \frac{13}{2}$
3) $y = 2x - 11$
4) $y = -2x + 17$

509 In the diagram below, the vertices of $\triangle DEF$ are the midpoints of the sides of equilateral triangle ABC, and the perimeter of $\triangle ABC$ is 36 cm.



What is the length, in centimeters, of $\overline{EF}$?
1) 6
2) 12
3) 18
4) 4

510 In the diagram of trapezoid $ABCD$ below, diagonals $\overline{AC}$ and $\overline{BD}$ intersect at E and $\triangle ABC \cong \triangle DCB$.

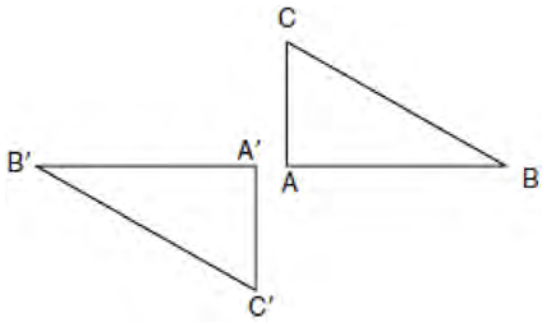


Which statement is true based on the given information?
1) $\overline{AC} \cong \overline{BC}$
2) $\overline{CD} \cong \overline{AD}$
3) $\angle CDE \cong \angle BAD$
4) $\angle CDB \cong \angle BAC$

511 Point A is not contained in plane $\mathcal{B}$. How many lines can be drawn through point A that will be perpendicular to plane $\mathcal{B}$?
1) one
2) two
3) zero
4) infinite

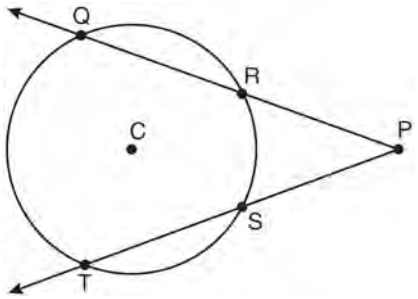
512 A support beam between the floor and ceiling of a house forms a 90º angle with the floor. The builder wants to make sure that the floor and ceiling are parallel. Which angle should the support beam form with the ceiling?
1) 45º
2) 60º
3) 90º
4) 180º

513 In the diagram below, under which transformation will $\triangle A'B'C'$ be the image of $\triangle ABC$?



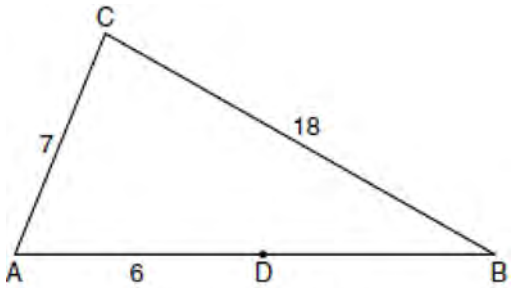
1) rotation
2) dilation
3) translation
4) glide reflection

514 In the diagram below of circle C, $m\overset{\frown}{QT} = 140$, and $m\angle P = 40$.



What is $m\overset{\frown}{RS}$?
1) 50
2) 60
3) 90
4) 110

515 In the diagram below of $\triangle ABC$, D is a point on $\overline{AB}$, $AC = 7$, $AD = 6$, and $BC = 18$.



(Not drawn to scale)

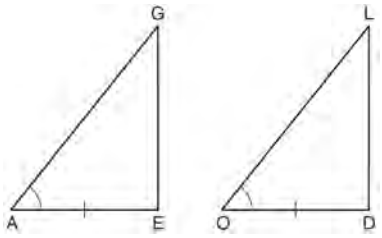
The length of $\overline{DB}$ could be
1) 5
2) 12
3) 19
4) 25

516 A quadrilateral whose diagonals bisect each other and are perpendicular is a
1) rhombus
2) rectangle
3) trapezoid
4) parallelogram

517 The lateral faces of a regular pyramid are composed of
1) squares
2) rectangles
3) congruent right triangles
4) congruent isosceles triangles

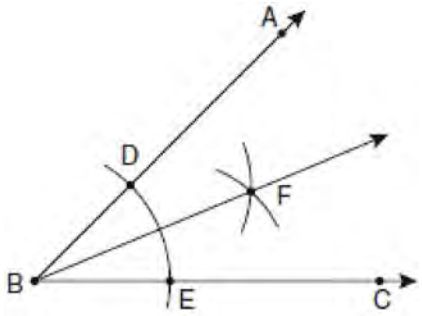
518 Which statement is logically equivalent to "If it is warm, then I go swimming"
1) If I go swimming, then it is warm.
2) If it is warm, then I do not go swimming.
3) If I do not go swimming, then it is not warm.
4) If it is not warm, then I do not go swimming.

519 In the diagram below of $\triangle AGE$ and $\triangle OLD$, $\angle GAE \cong \angle LOD$, and $\overline{AE} \cong \overline{OD}$.



To prove that $\triangle AGE$ and $\triangle OLD$ are congruent by SAS, what other information is needed?
1) $\overline{GE} \cong \overline{LD}$
2) $\overline{AG} \cong \overline{OL}$
3) $\angle AGE \cong \angle OLD$
4) $\angle AEG \cong \angle ODL$

520 The diagram below shows the construction of the bisector of $\angle ABC$.



Which statement is *not* true?

1) $m\angle EBF = \frac{1}{2} m\angle ABC$
2) $m\angle DBF = \frac{1}{2} m\angle ABC$
3) $m\angle EBF = m\angle ABC$
4) $m\angle DBF = m\angle EBF$

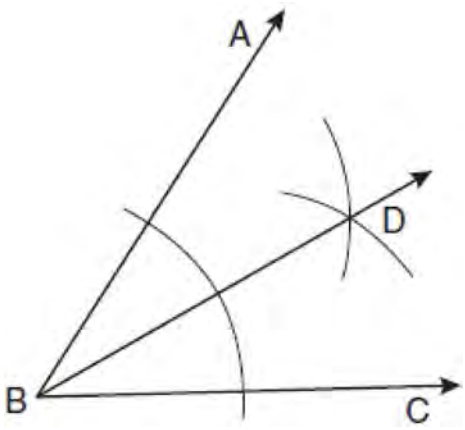
521 In $\triangle ABC$, $m\angle A = 95$, $m\angle B = 50$, and $m\angle C = 35$. Which expression correctly relates the lengths of the sides of this triangle?

1) $AB < BC < CA$
2) $AB < AC < BC$
3) $AC < BC < AB$
4) $BC < AC < AB$

522 What is the image of point $A(4,2)$ after the composition of transformations defined by $R_{90°} \circ r_{y=x}$?

1) $(-4,2)$
2) $(4,-2)$
3) $(-4,-2)$
4) $(2,-4)$

523 Based on the construction below, which statement must be true?



1) $m\angle ABD = \frac{1}{2} m\angle CBD$
2) $m\angle ABD = m\angle CBD$
3) $m\angle ABD = m\angle ABC$
4) $m\angle CBD = \frac{1}{2} m\angle ABD$

524 Through a given point, *P*, on a plane, how many lines can be drawn that are perpendicular to that plane?

1) 1
2) 2
3) more than 2
4) none

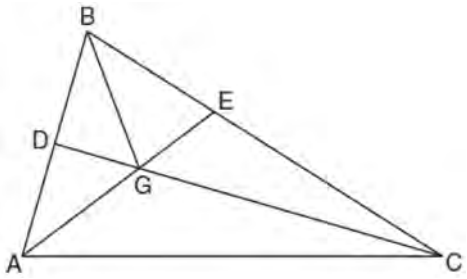
525 What is the measure of an interior angle of a regular octagon?

1) 45°
2) 60°
3) 120°
4) 135°

526 In isosceles trapezoid $ABCD$, $\overline{AB} \cong \overline{CD}$. If $BC = 20$, $AD = 36$, and $AB = 17$, what is the length of the altitude of the trapezoid?
1) 10
2) 12
3) 15
4) 16

527 Line segment AB has endpoints $A(2,-3)$ and $B(-4,6)$. What are the coordinates of the midpoint of $\overline{AB}$?
1) $(-2,3)$
2) $\left(-1,1\frac{1}{2}\right)$
3) $(-1,3)$
4) $\left(3,4\frac{1}{2}\right)$

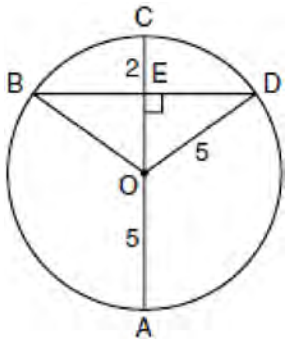
528 In the diagram below of $\triangle ABC$, $\overline{CD}$ is the bisector of $\angle BCA$, $\overline{AE}$ is the bisector of $\angle CAB$, and $\overline{BG}$ is drawn.



Which statement must be true?
1) $DG = EG$
2) $AG = BG$
3) $\angle AEB \cong \angle AEC$
4) $\angle DBG \cong \angle EBG$

529 What is the negation of the statement "The Sun is shining"?
1) It is cloudy.
2) It is daytime.
3) It is not raining.
4) The Sun is not shining.

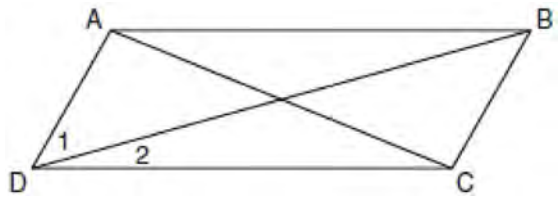
530 In the diagram below, circle O has a radius of 5, and $CE = 2$. Diameter $\overline{AC}$ is perpendicular to chord $\overline{BD}$ at E.



What is the length of $\overline{BD}$?
1) 12
2) 10
3) 8
4) 4

531 A rectangular prism has a volume of $3x^2 + 18x + 24$. Its base has a length of $x + 2$ and a width of 3. Which expression represents the height of the prism?
1) $x + 4$
2) $x + 2$
3) 3
4) $x^2 + 6x + 8$

532 In the diagram below of parallelogram $ABCD$ with diagonals $\overline{AC}$ and $\overline{BD}$, $m\angle 1 = 45$ and $m\angle DCB = 120$.



What is the measure of $\angle 2$?

1) 15°
2) 30°
3) 45°
4) 60°

533 Which transformation produces a figure similar but not congruent to the original figure?

1) $T_{1,3}$
2) $D_{\frac{1}{2}}$
3) R_{90°
4) $r_{y=x}$

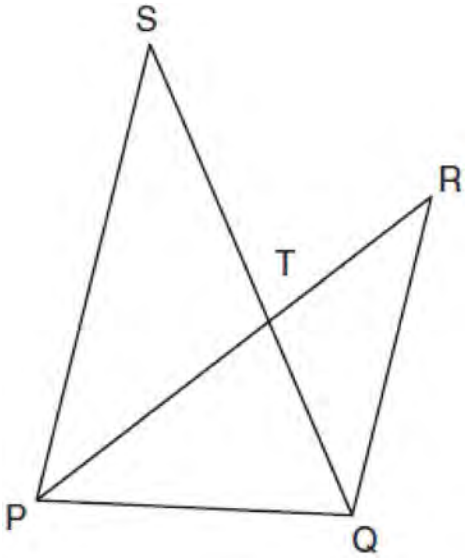
534 Which set of numbers represents the lengths of the sides of a triangle?

1) $\{5, 18, 13\}$
2) $\{6, 17, 22\}$
3) $\{16, 24, 7\}$
4) $\{26, 8, 15\}$

535 In a coordinate plane, how many points are both 5 units from the origin and 2 units from the x-axis?

1) 1
2) 2
3) 3
4) 4

536 In the diagram below, $\overline{SQ}$ and $\overline{PR}$ intersect at T, $\overline{PQ}$ is drawn, and $\overline{PS} \parallel \overline{QR}$.



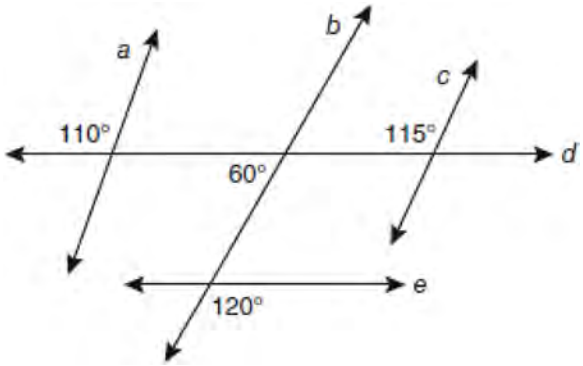
What technique can be used to prove that $\triangle PST \sim \triangle RQT$?

1) SAS
2) SSS
3) ASA
4) AA

537 A right circular cylinder has a volume of 1,000 cubic inches and a height of 8 inches. What is the radius of the cylinder to the *nearest tenth of an inch*?

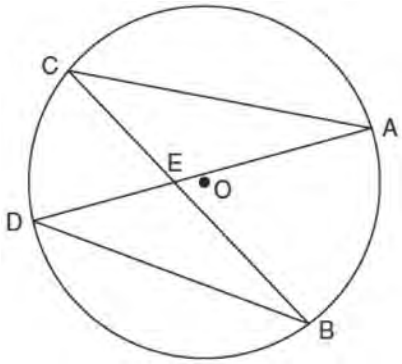
1) 6.3
2) 11.2
3) 19.8
4) 39.8

538 Based on the diagram below, which statement is true?



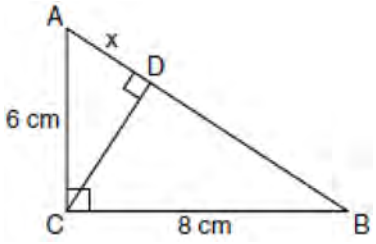
1) $a \parallel b$
2) $a \parallel c$
3) $b \parallel c$
4) $d \parallel e$

539 In the diagram below of circle O, chords $\overline{AD}$ and $\overline{BC}$ intersect at E.



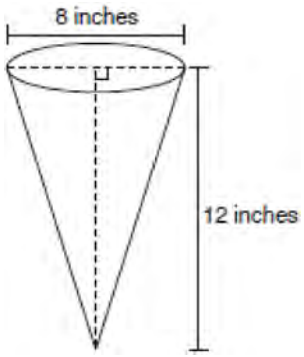
Which relationship must be true?
1) $\triangle CAE \cong \triangle DBE$
2) $\triangle AEC \sim \triangle BED$
3) $\angle ACB \cong \angle CBD$
4) $\overset{\frown}{CA} \cong \overset{\frown}{DB}$

540 In the diagram below, the length of the legs $\overline{AC}$ and $\overline{BC}$ of right triangle ABC are 6 cm and 8 cm, respectively. Altitude $\overline{CD}$ is drawn to the hypotenuse of $\triangle ABC$.



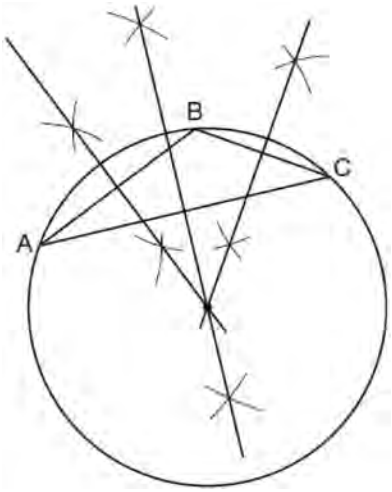
What is the length of $\overline{AD}$ to the *nearest tenth of a centimeter*?
1) 3.6
2) 6.0
3) 6.4
4) 4.0

541 In the diagram below, a right circular cone has a diameter of 8 inches and a height of 12 inches.



What is the volume of the cone to the *nearest cubic inch*?
1) 201
2) 481
3) 603
4) 804

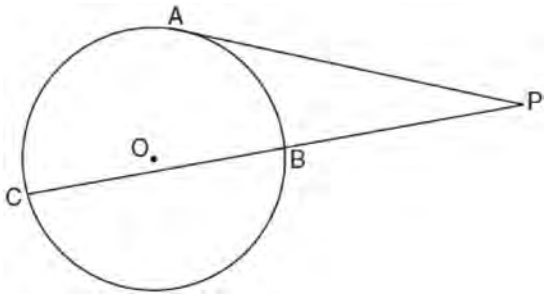
542 The diagram below shows the construction of the center of the circle circumscribed about $\triangle ABC$.



This construction represents how to find the intersection of

1) the angle bisectors of $\triangle ABC$
2) the medians to the sides of $\triangle ABC$
3) the altitudes to the sides of $\triangle ABC$
4) the perpendicular bisectors of the sides of $\triangle ABC$

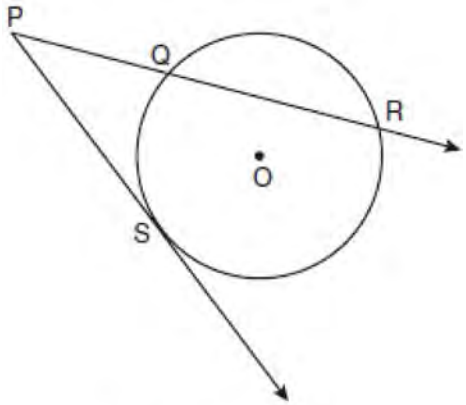
543 In the diagram below, tangent $\overline{PA}$ and secant $\overline{PBC}$ are drawn to circle O from external point P.



If $PB = 4$ and $BC = 5$, what is the length of $\overline{PA}$?

1) 20
2) 9
3) 8
4) 6

544 In the diagram below, $\overline{PS}$ is a tangent to circle O at point S, $\overline{PQR}$ is a secant, $PS = x$, $PQ = 3$, and $PR = x + 18$.



(Not drawn to scale)

What is the length of $\overline{PS}$?

1) 6
2) 9
3) 3
4) 27

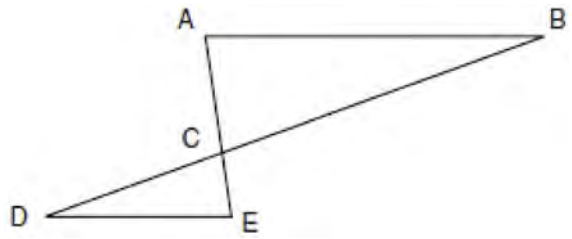
545 What is the negation of the statement "Squares are parallelograms"?

1) Parallelograms are squares.
2) Parallelograms are not squares.
3) It is not the case that squares are parallelograms.
4) It is not the case that parallelograms are squares.

546 The diagonal $\overline{AC}$ is drawn in parallelogram $ABCD$. Which method can *not* be used to prove that $\triangle ABC \cong \triangle CDA$?

1) SSS
2) SAS
3) SSA
4) ASA

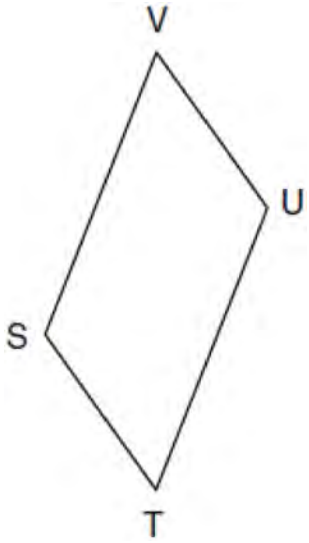
547 In the diagram of $\triangle ABC$ and $\triangle EDC$ below, $\overline{AE}$ and $\overline{BD}$ intersect at C, and $\angle CAB \cong \angle CED$.



Which method can be used to show that $\triangle ABC$ must be similar to $\triangle EDC$?

1) SAS
2) AA
3) SSS
4) HL

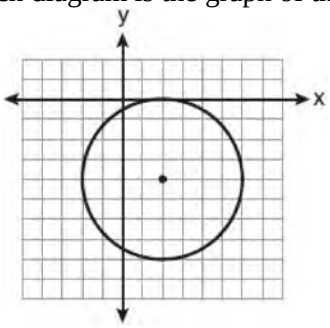
548 In the diagram below of parallelogram $STUV$, $SV = x + 3$, $VU = 2x - 1$, and $TU = 4x - 3$.

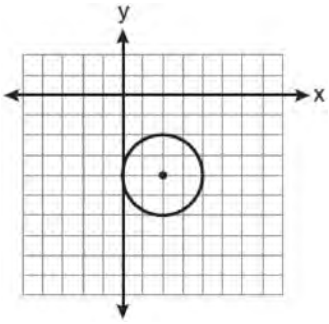


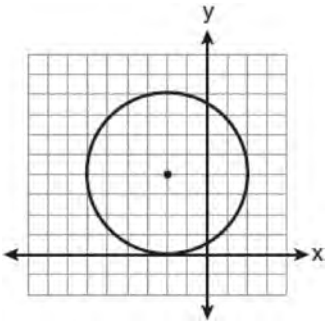
What is the length of $\overline{SV}$?

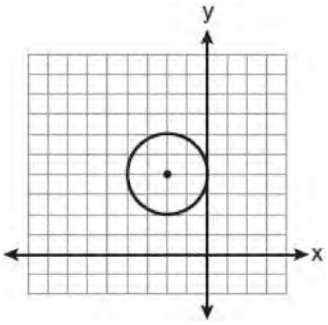
1) 5
2) 2
3) 7
4) 4

549 The equation of a circle is $(x-2)^2 + (y+4)^2 = 4$. Which diagram is the graph of the circle?

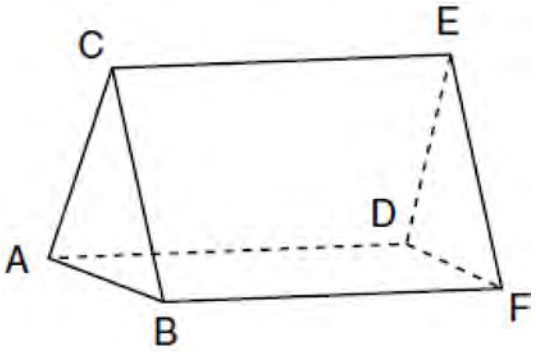
1)


2)


3)


4)


550 The figure in the diagram below is a triangular prism.



Which statement must be true?

1) $\overline{DE} \cong \overline{AB}$
2) $\overline{AD} \cong \overline{BC}$
3) $\overline{AD} \parallel \overline{CE}$
4) $\overline{DE} \parallel \overline{BC}$

551 The diameter of a circle has endpoints at $(-2,3)$ and $(6,3)$. What is an equation of the circle?

1) $(x-2)^2+(y-3)^2=16$
2) $(x-2)^2+(y-3)^2=4$
3) $(x+2)^2+(y+3)^2=16$
4) $(x+2)^2+(y+3)^2=4$

552 In $\triangle ABC$, $AB=7$, $BC=8$, and $AC=9$. Which list has the angles of $\triangle ABC$ in order from smallest to largest?

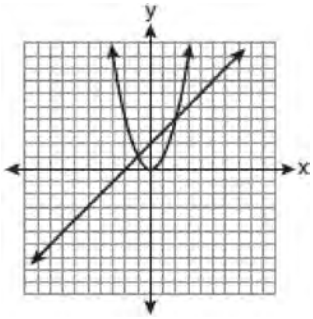
1) $\angle A, \angle B, \angle C$
2) $\angle B, \angle A, \angle C$
3) $\angle C, \angle B, \angle A$
4) $\angle C, \angle A, \angle B$

553 Which graph could be used to find the solution to the following system of equations?

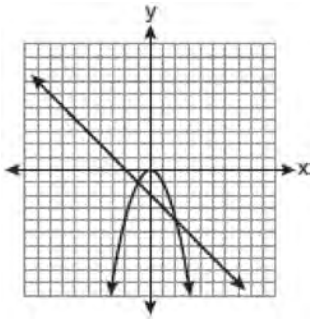
$y=-x+2$

$y=x^2$

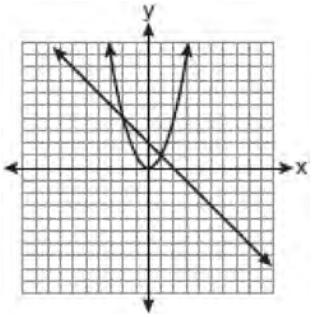
1)



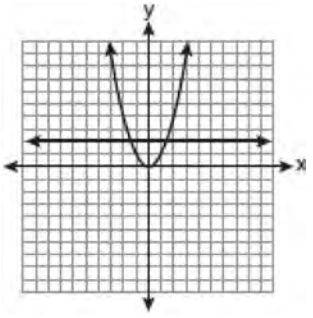
2)



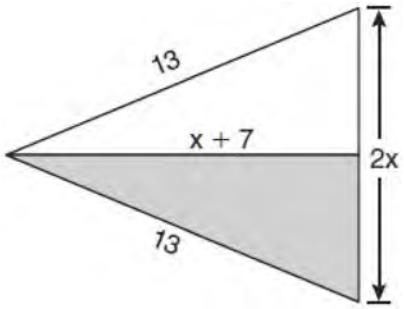
3)



4)

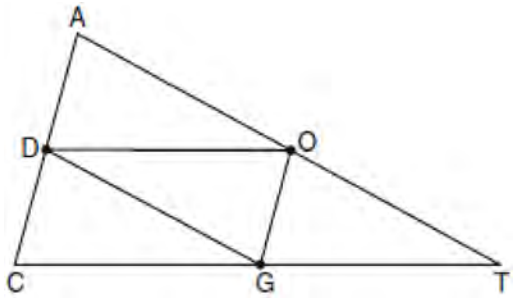


554 The diagram below shows a pennant in the shape of an isosceles triangle. The equal sides each measure 13, the altitude is $x + 7$, and the base is $2x$.



What is the length of the base?
1) 5
2) 10
3) 12
4) 24

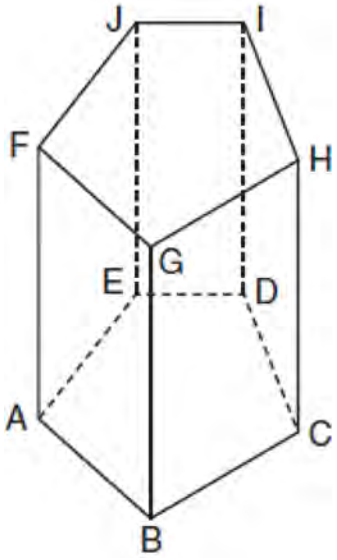
555 In the diagram below of $\triangle ACT$, D is the midpoint of $\overline{AC}$, O is the midpoint of $\overline{AT}$, and G is the midpoint of $\overline{CT}$.



If $AC = 10$, $AT = 18$, and $CT = 22$, what is the perimeter of parallelogram $CDOG$?
1) 21
2) 25
3) 32
4) 40

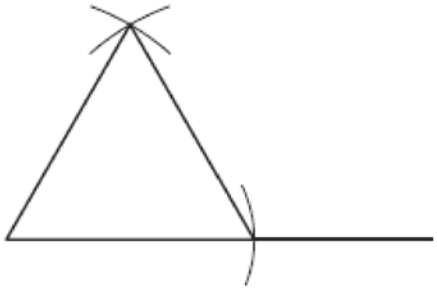
556 If a line segment has endpoints $A(3x + 5, 3y)$ and $B(x - 1, -y)$, what are the coordinates of the midpoint of $\overline{AB}$?
1) $(x + 3, 2y)$
2) $(2x + 2, y)$
3) $(2x + 3, y)$
4) $(4x + 4, 2y)$

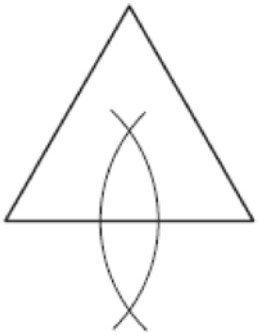
557 The diagram below shows a right pentagonal prism.

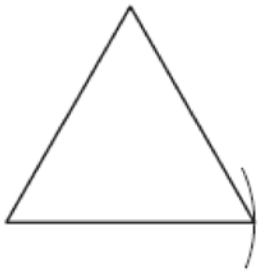


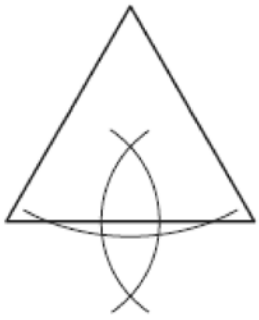
Which statement is always true?
1) $\overline{BC} \parallel \overline{ED}$
2) $\overline{FG} \parallel \overline{CD}$
3) $\overline{FJ} \parallel \overline{IH}$
4) $\overline{GB} \parallel \overline{HC}$

558 Which diagram shows the construction of an equilateral triangle?

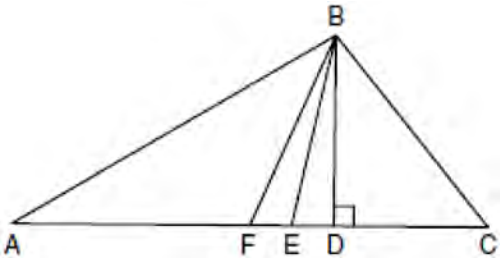
1) 

2) 

3) 

4) 

559 Given $\triangle ABC$ with base $\overline{AFEDC}$, median $\overline{BF}$, altitude $\overline{BD}$, and $\overline{BE}$ bisects $\angle ABC$, which conclusion is valid?



1) $\angle FAB \cong \angle ABF$
2) $\angle ABF \cong \angle CBD$
3) $\overline{CE} \cong \overline{EA}$
4) $\overline{CF} \cong \overline{FA}$

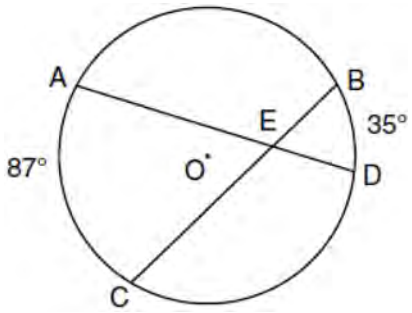
560 One step in a construction uses the endpoints of $\overline{AB}$ to create arcs with the same radii. The arcs intersect above and below the segment. What is the relationship of $\overline{AB}$ and the line connecting the points of intersection of these arcs?

1) collinear
2) congruent
3) parallel
4) perpendicular

561 In which triangle do the three altitudes intersect outside the triangle?

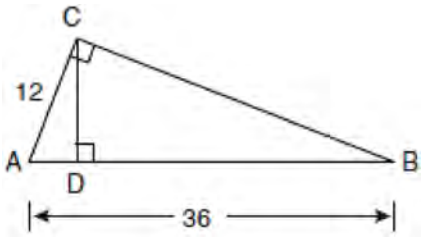
1) a right triangle
2) an acute triangle
3) an obtuse triangle
4) an equilateral triangle

562 In the diagram below of circle O, chords $\overline{AD}$ and $\overline{BC}$ intersect at E, $m\overset{\frown}{AC} = 87$, and $m\overset{\frown}{BD} = 35$.



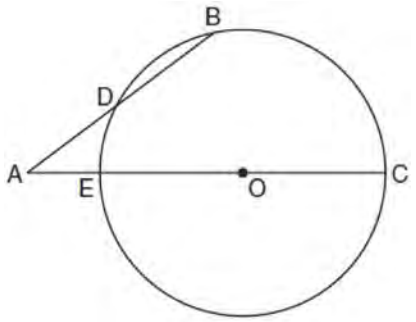
What is the degree measure of $\angle CEA$?
1) 87
2) 61
3) 43.5
4) 26

563 In the diagram below of right triangle ACB, altitude $\overline{CD}$ is drawn to hypotenuse $\overline{AB}$.



If $AB = 36$ and $AC = 12$, what is the length of $\overline{AD}$?
1) 32
2) 6
3) 3
4) 4

564 In the diagram below of circle O, secant $\overline{AB}$ intersects circle O at D, secant $\overline{AOC}$ intersects circle O at E, $AE = 4$, $AB = 12$, and $DB = 6$.



(Not drawn to scale)

What is the length of $\overline{OC}$?
1) 4.5
2) 7
3) 9
4) 14

565 What is the distance between the points $(-3, 2)$ and $(1, 0)$?
1) $2\sqrt{2}$
2) $2\sqrt{3}$
3) $5\sqrt{2}$
4) $2\sqrt{5}$

566 Point P is on line m. What is the total number of planes that are perpendicular to line m and pass through point P?
1) 1
2) 2
3) 0
4) infinite

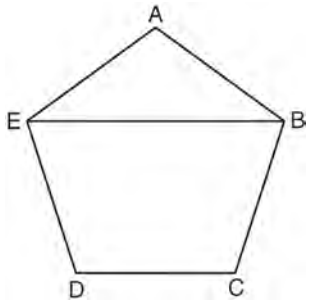
567 In isosceles triangle ABC, $AB = BC$. Which statement will always be true?

1) $m\angle B = m\angle A$
2) $m\angle A > m\angle B$
3) $m\angle A = m\angle C$
4) $m\angle C < m\angle B$

568 What is the inverse of the statement "If two triangles are not similar, their corresponding angles are not congruent"?

1) If two triangles are similar, their corresponding angles are not congruent.
2) If corresponding angles of two triangles are not congruent, the triangles are not similar.
3) If two triangles are similar, their corresponding angles are congruent.
4) If corresponding angles of two triangles are congruent, the triangles are similar.

569 In the diagram below of regular pentagon $ABCDE$, $\overline{EB}$ is drawn.



What is the measure of $\angle AEB$?

1) 36°
2) 54°
3) 72°
4) 108°

570 The lines represented by the equations $y + \frac{1}{2}x = 4$ and $3x + 6y = 12$ are

1) the same line
2) parallel
3) perpendicular
4) neither parallel nor perpendicular

571 Which equation represents the circle whose center is $(-2,3)$ and whose radius is 5?

1) $(x-2)^2 + (y+3)^2 = 5$
2) $(x+2)^2 + (y-3)^2 = 5$
3) $(x+2)^2 + (y-3)^2 = 25$
4) $(x-2)^2 + (y+3)^2 = 25$

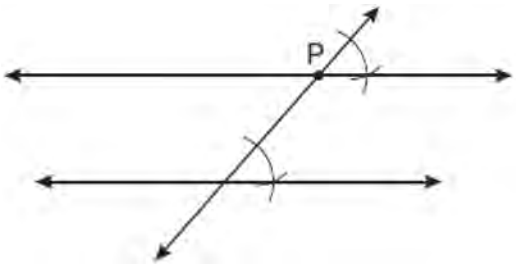
572 What is the equation of a line that passes through the point $(-3,-11)$ and is parallel to the line whose equation is $2x - y = 4$?

1) $y = 2x + 5$
2) $y = 2x - 5$
3) $y = \frac{1}{2}x + \frac{25}{2}$
4) $y = -\frac{1}{2}x - \frac{25}{2}$

573 Triangle ABC has vertices $A(1,3)$, $B(0,1)$, and $C(4,0)$. Under a translation, A', the image point of A, is located at $(4,4)$. Under this same translation, point C' is located at

1) $(7,1)$
2) $(5,3)$
3) $(3,2)$
4) $(1,-1)$

574 Which geometric principle is used to justify the construction below?



1) A line perpendicular to one of two parallel lines is perpendicular to the other.
2) Two lines are perpendicular if they intersect to form congruent adjacent angles.
3) When two lines are intersected by a transversal and alternate interior angles are congruent, the lines are parallel.
4) When two lines are intersected by a transversal and the corresponding angles are congruent, the lines are parallel.

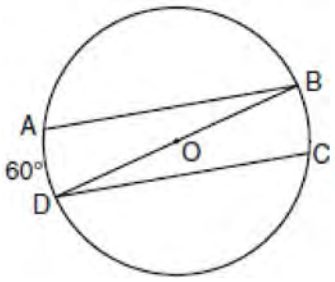
575 What are the center and radius of a circle whose equation is $(x-A)^2+(y-B)^2=C$?

1) center = (A,B); radius = C
2) center = $(-A,-B)$; radius = C
3) center = (A,B); radius = $\sqrt{C}$
4) center = $(-A,-B)$; radius = $\sqrt{C}$

576 Which equation represents a line parallel to the line whose equation is $2y-5x=10$?

1) $5y-2x=25$
2) $5y+2x=10$
3) $4y-10x=12$
4) $2y+10x=8$

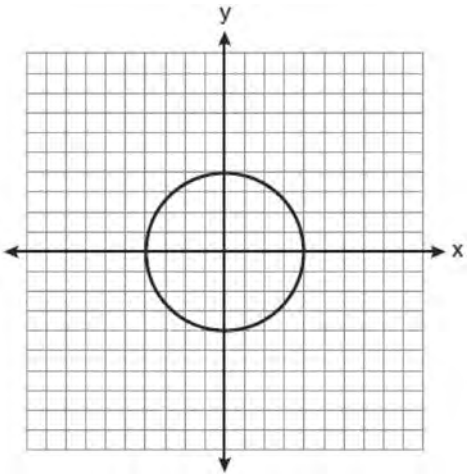
577 In the diagram of circle O below, chords $\overline{AB}$ and $\overline{CD}$ are parallel, and $\overline{BD}$ is a diameter of the circle.



If $m\overset{\frown}{AD}=60$, what is $m\angle CDB$?

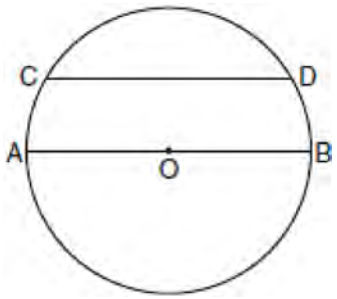
1) 20
2) 30
3) 60
4) 120

578 What is an equation for the circle shown in the graph below?



1) $x^2+y^2=2$
2) $x^2+y^2=4$
3) $x^2+y^2=8$
4) $x^2+y^2=16$

579 In the diagram of circle O below, chord $\overline{CD}$ is parallel to diameter $\overline{AOB}$ and $m\overset{\frown}{AC} = 30$.



What is $m\overset{\frown}{CD}$?

1) 150
2) 120
3) 100
4) 60

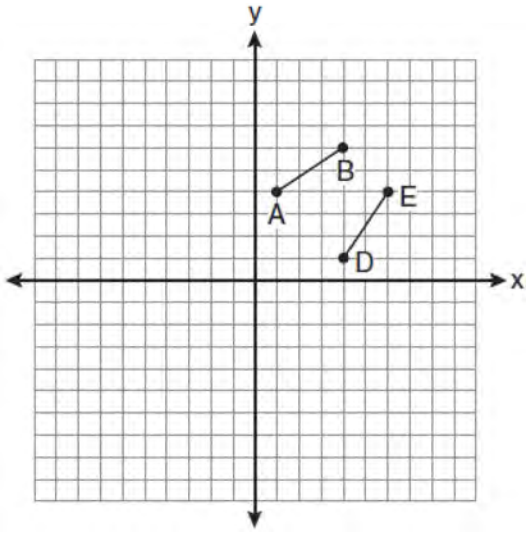
580 What is the slope of a line perpendicular to the line whose equation is $5x + 3y = 8$?

1) $\frac{5}{3}$
2) $\frac{3}{5}$
3) $-\frac{3}{5}$
4) $-\frac{5}{3}$

581 A circle is represented by the equation $x^2 + (y+3)^2 = 13$. What are the coordinates of the center of the circle and the length of the radius?

1) $(0,3)$ and 13
2) $(0,3)$ and $\sqrt{13}$
3) $(0,-3)$ and 13
4) $(0,-3)$ and $\sqrt{13}$

582 The diagram below shows $\overline{AB}$ and $\overline{DE}$.



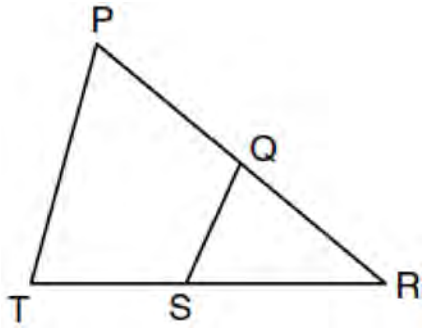
Which transformation will move $\overline{AB}$ onto $\overline{DE}$ such that point D is the image of point A and point E is the image of point B?

1) $T_{3,-3}$
2) $D_{\frac{1}{2}}$
3) $R_{90°}$
4) $r_{y=x}$

583 In plane $\mathcal{P}$, lines m and n intersect at point A. If line k is perpendicular to line m and line n at point A, then line k is

1) contained in plane $\mathcal{P}$
2) parallel to plane $\mathcal{P}$
3) perpendicular to plane $\mathcal{P}$
4) skew to plane $\mathcal{P}$

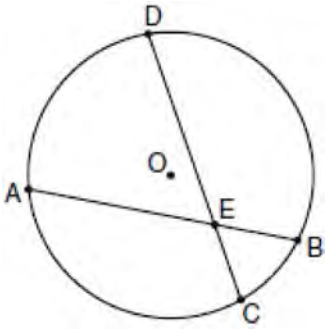
584 In the diagram below of $\triangle PRT$, Q is a point on $\overline{PR}$, S is a point on $\overline{TR}$, $\overline{QS}$ is drawn, and $\angle RPT \cong \angle RSQ$.



Which reason justifies the conclusion that $\triangle PRT \sim \triangle SRQ$?

1) AA
2) ASA
3) SAS
4) SSS

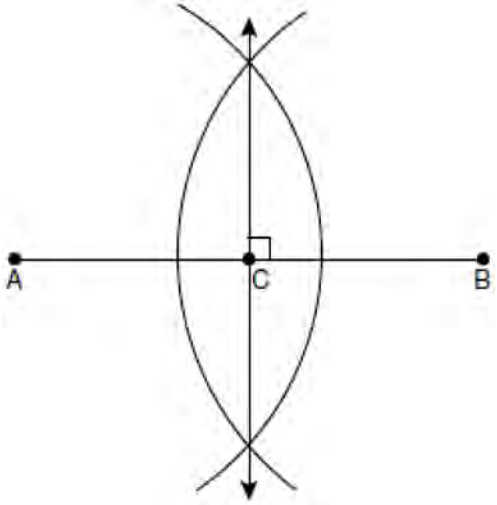
585 In the diagram of circle O below, chord $\overline{AB}$ intersects chord $\overline{CD}$ at E, $DE = 2x + 8$, $EC = 3$, $AE = 4x - 3$, and $EB = 4$.



What is the value of x?

1) 1
2) 3.6
3) 5
4) 10.25

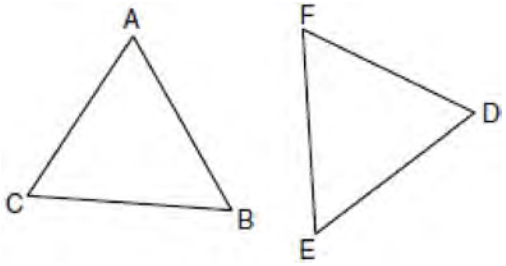
586 The diagram below shows the construction of the perpendicular bisector of $\overline{AB}$.



Which statement is *not* true?

1) $AC = CB$
2) $CB = \frac{1}{2}AB$
3) $AC = 2AB$
4) $AC + CB = AB$

587 In the diagram of $\triangle ABC$ and $\triangle DEF$ below, $\overline{AB} \cong \overline{DE}$, $\angle A \cong \angle D$, and $\angle B \cong \angle E$.



Which method can be used to prove $\triangle ABC \cong \triangle DEF$?

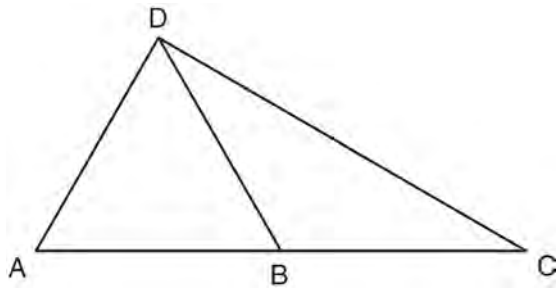
1) SSS
2) SAS
3) ASA
4) HL

588 A polygon is transformed according to the rule: $(x,y) \rightarrow (x+2,y)$. Every point of the polygon moves two units in which direction?

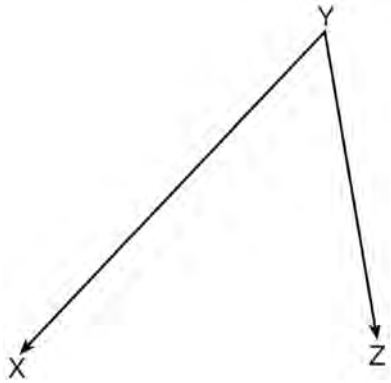
1) up
2) down
3) left
4) right

Geometry 2 Point Regents Exam Questions

589 In the diagram below of $\triangle ACD$, B is a point on $\overline{AC}$ such that $\triangle ADB$ is an equilateral triangle, and $\triangle DBC$ is an isosceles triangle with $\overline{DB} \cong \overline{BC}$. Find $m\angle C$.

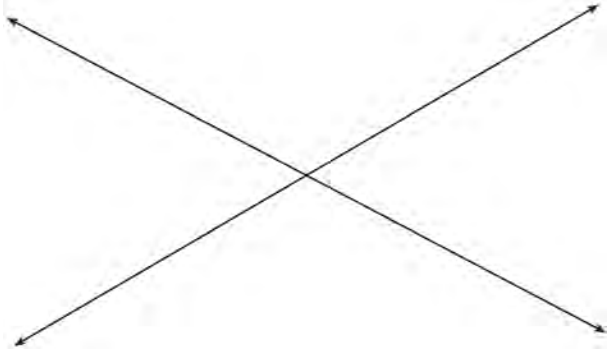


590 On the diagram below, use a compass and straightedge to construct the bisector of $\angle XYZ$. [Leave all construction marks.]

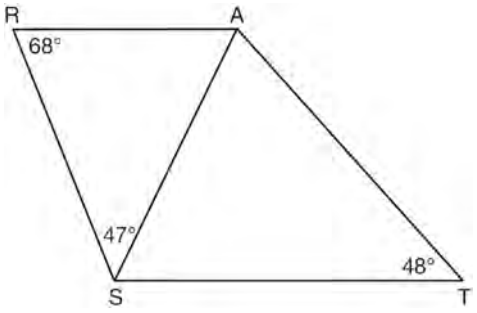


591 Determine and state the measure, in degrees, of an interior angle of a regular decagon.

592 Two intersecting lines are shown in the diagram below. Sketch the locus of points that are equidistant from the two lines. Sketch the locus of points that are a given distance, d, from the point of intersection of the given lines. State the number of points that satisfy both conditions.

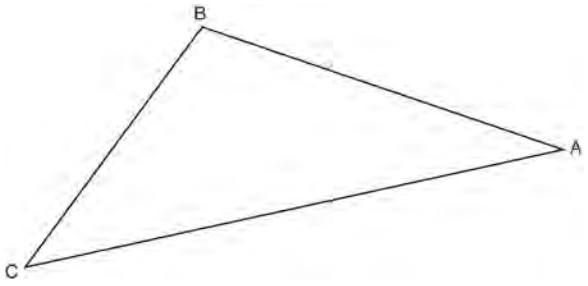


593 As shown in the diagram below, $\overline{AS}$ is a diagonal of trapezoid $STAR$, $\overline{RA} \parallel \overline{ST}$, $m\angle ATS = 48$, $m\angle RSA = 47$, and $m\angle ARS = 68$.

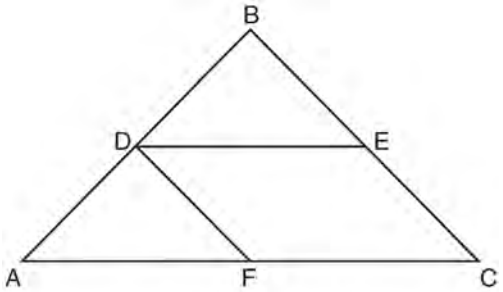


Determine and state the longest side of $\triangle SAT$.

594 Using a compass and straightedge, construct the bisector of $\angle CBA$. [Leave all construction marks.]



595 In the diagram below of $\triangle ABC$, $\overline{DE}$ and $\overline{DF}$ are midsegments.



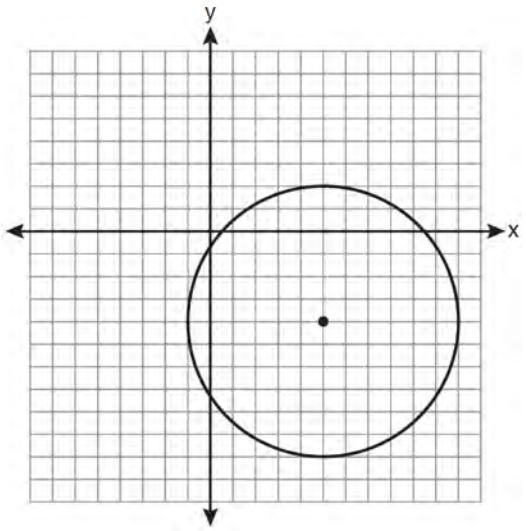
(Not drawn to scale)

If $DE = 9$, and $BC = 17$, determine and state the perimeter of quadrilateral $FDEC$.

596 Tim is going to paint a wooden sphere that has a diameter of 12 inches. Find the surface area of the sphere, to the *nearest square inch*.

597 Write an equation of the line that is perpendicular to the line whose equation is $2y = 3x + 12$ and that passes through the origin.

598 Write an equation of the circle graphed in the diagram below.



599 Determine whether the two lines represented by the equations $y = 2x + 3$ and $2y + x = 6$ are parallel, perpendicular, or neither. Justify your response.

600 A right prism has a square base with an area of 12 square meters. The volume of the prism is 84 cubic meters. Determine and state the height of the prism, in meters.

601 Triangle RST is similar to $\triangle XYZ$ with $RS = 3$ inches and $XY = 2$ inches. If the area of $\triangle RST$ is 27 square inches, determine and state the area of $\triangle XYZ$, in square inches.

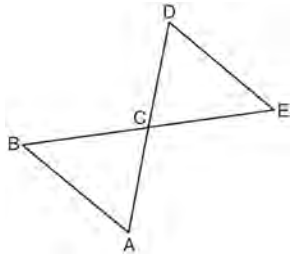
602 In $\triangle ABC$, the measure of angle A is fifteen less than twice the measure of angle B. The measure of angle C equals the sum of the measures of angle A and angle B. Determine the measure of angle B.

603 A circle has the equation $(x-3)^2+(y+4)^2=10$. Find the coordinates of the center of the circle and the length of the circle's radius.

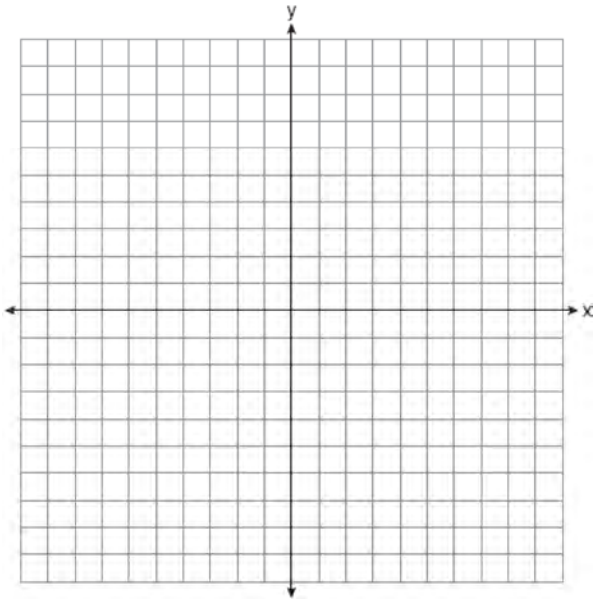
604 In circle O, diameter $\overline{RS}$ has endpoints $R(3a, 2b-1)$ and $S(a-6, 4b+5)$. Find the coordinates of point O, in terms of a and b. Express your answer in simplest form.

605 Triangle ABC has vertices $A(6,6)$, $B(9,0)$, and $C(3,-3)$. State and label the coordinates of $\triangle A'B'C'$, the image of $\triangle ABC$ after a dilation of $D\frac{1}{3}$.

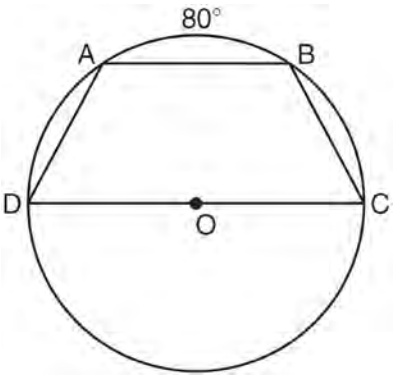
606 Given: $\overline{BE}$ and $\overline{AD}$ intersect at point C
$\overline{BC} \cong \overline{EC}$
$\overline{AC} \cong \overline{DC}$
$\overline{AB}$ and $\overline{DE}$ are drawn
Prove: $\triangle ABC \cong \triangle DEC$



607 The image of $\overline{RS}$ after a reflection through the origin is $\overline{R'S'}$. If the coordinates of the endpoints of $\overline{RS}$ are $R(2,-3)$ and $S(5,1)$, state and label the coordinates of R' and S'. [The use of the set of axes below is optional.]



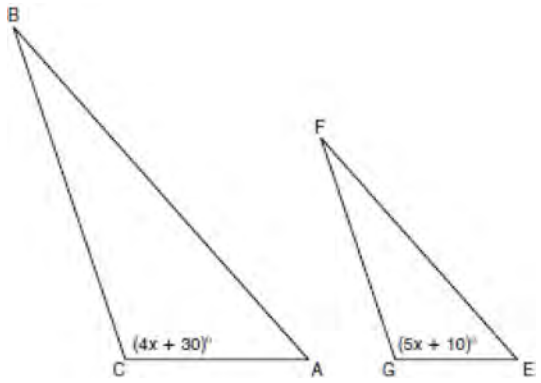
608 In the diagram below, trapezoid $ABCD$, with bases $\overline{AB}$ and $\overline{DC}$, is inscribed in circle O, with diameter $\overline{DC}$. If $m\overset{\frown}{AB}=80$, find $m\overset{\frown}{BC}$.



609 Write a statement that is logically equivalent to the statement "If two sides of a triangle are congruent, the angles opposite those sides are congruent." Identify the new statement as the converse, inverse, or contrapositive of the original statement.

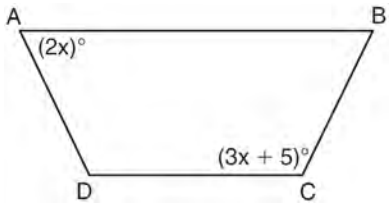
610 The Parkside Packing Company needs a rectangular shipping box. The box must have a length of 11 inches and a width of 8 inches. Find, to the *nearest tenth of an inch*, the minimum height of the box such that the volume is *at least* 800 cubic inches.

611 In the diagram below, $\triangle ABC \sim \triangle EFG$, $m\angle C = 4x + 30$, and $m\angle G = 5x + 10$. Determine the value of x.

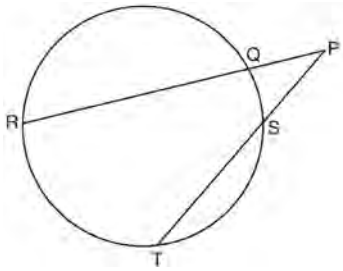


612 Two prisms with equal altitudes have equal volumes. The base of one prism is a square with a side length of 5 inches. The base of the second prism is a rectangle with a side length of 10 inches. Determine and state, in inches, the measure of the width of the rectangle.

613 The diagram below shows isosceles trapezoid $ABCD$ with $\overline{AB} \parallel \overline{DC}$ and $\overline{AD} \cong \overline{BC}$. If $m\angle BAD = 2x$ and $m\angle BCD = 3x + 5$, find $m\angle BAD$.



614 In the diagram below, secants $\overline{PQR}$ and $\overline{PST}$ are drawn to a circle from point P.



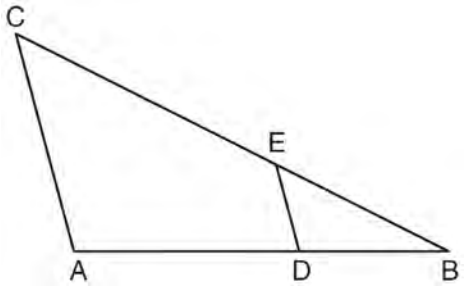
If $PR = 24$, $PQ = 6$, and $PS = 8$, determine and state the length of $\overline{PT}$.

615 In $\triangle RST$, $m\angle RST = 46$ and $\overline{RS} \cong \overline{ST}$. Find $m\angle STR$.

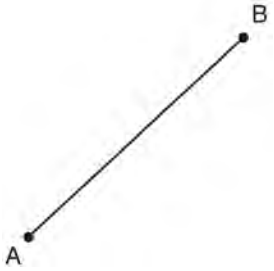
616 The degree measures of the angles of $\triangle ABC$ are represented by x, $3x$, and $5x - 54$. Find the value of x.

617 The endpoints of $\overline{AB}$ are $A(3,-4)$ and $B(7,2)$. Determine and state the length of $\overline{AB}$ in simplest radical form.

618 In the diagram below of $\triangle ABC$, D is a point on $\overline{AB}$, E is a point on $\overline{BC}$, $\overline{AC} \parallel \overline{DE}$, $CE = 25$ inches, $AD = 18$ inches, and $DB = 12$ inches. Find, to the *nearest tenth of an inch*, the length of $\overline{EB}$.



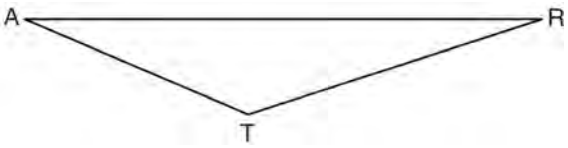
619 Using a compass and straightedge, construct the perpendicular bisector of $\overline{AB}$. [Leave all construction marks.]



620 The coordinates of the endpoints of $\overline{CD}$ are $C(3,8)$ and $D(6,-1)$. Find the length of $\overline{CD}$ in simplest radical form.

621 Find an equation of the line passing through the point $(5,4)$ and parallel to the line whose equation is $2x + y = 3$.

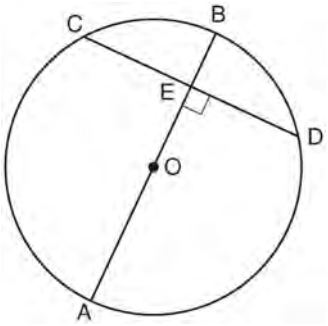
622 Using a compass and straightedge, construct the perpendicular bisector of side $\overline{AR}$ in $\triangle ART$ shown below. [Leave all construction marks.]



623 The base of a pyramid is a rectangle with a width of 6 cm and a length of 8 cm. Find, in centimeters, the height of the pyramid if the volume is $288\,\text{cm}^3$.

624 Write the negation of the statement "2 is a prime number," and determine the truth value of the negation.

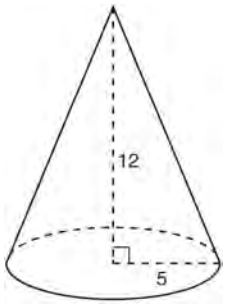
625 In the diagram below of circle O, diameter $\overline{AB}$ is perpendicular to chord $\overline{CD}$ at E. If $AO = 10$ and $BE = 4$, find the length of $\overline{CE}$.



626 Using a compass and straightedge, on the diagram below of $\overleftrightarrow{RS}$, construct an equilateral triangle with $\overline{RS}$ as one side. [Leave all construction marks.]

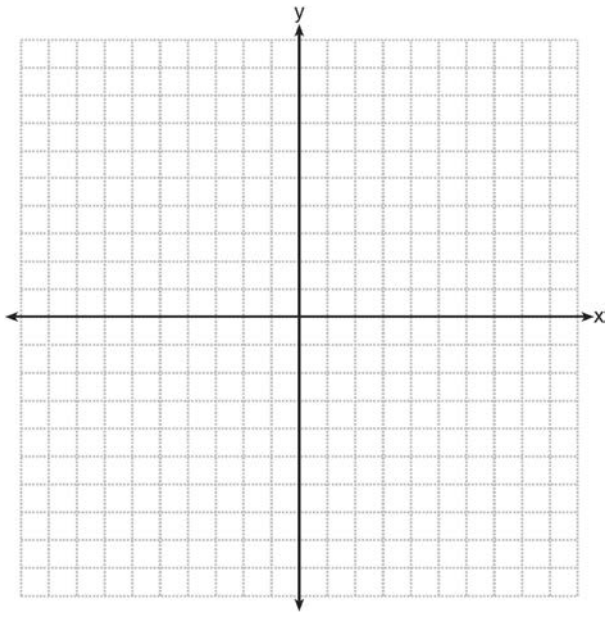
627 The coordinates of the endpoints of $\overline{FG}$ are $(-4,3)$ and $(2,5)$. Find the length of $\overline{FG}$ in simplest radical form.

628 As shown in the diagram below, a right circular cone has a height of 12 and a radius of 5.



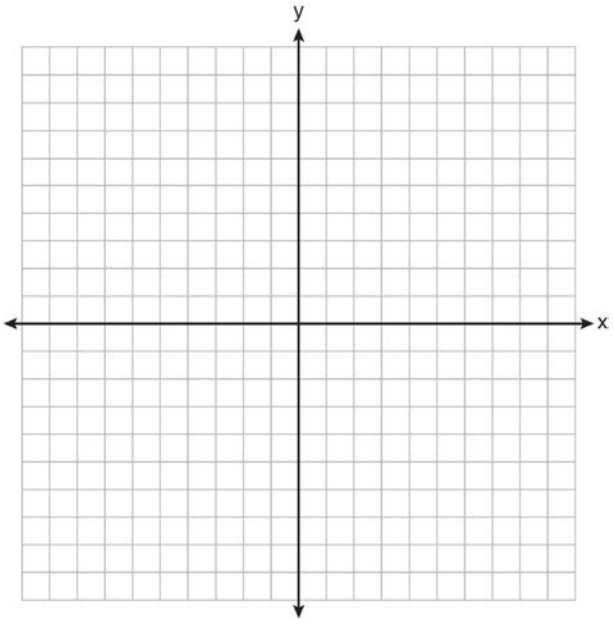
Determine, in terms of π, the lateral area of the right circular cone.

629 The coordinates of the vertices of $\triangle ABC$ are $A(1,2)$, $B(-4,3)$, and $C(-3,-5)$. State the coordinates of $\triangle A'B'C'$, the image of $\triangle ABC$ after a rotation of 90º about the origin. [The use of the set of axes below is optional.]



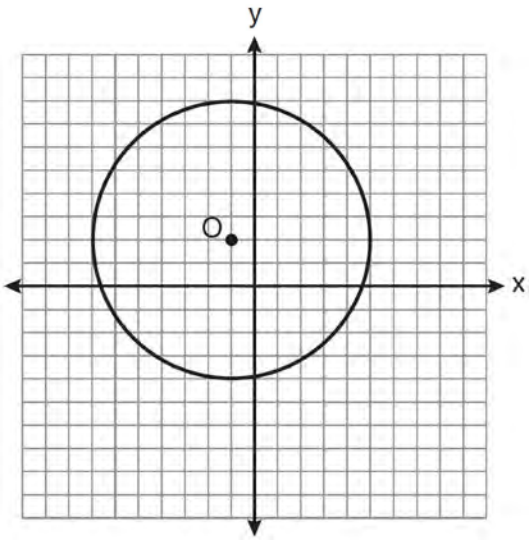
630 A right circular cone has a base with a radius of 15 cm, a vertical height of 20 cm, and a slant height of 25 cm. Find, in terms of' π, the number of square centimeters in the lateral area of the cone.

631 The coordinates of the vertices of $\triangle RST$ are $R(-2,3)$, $S(4,4)$, and $T(2,-2)$. Triangle $R'S'T'$ is the image of $\triangle RST$ after a rotation of 90° about the origin. State the coordinates of the vertices of $\triangle R'S'T'$. [The use of the set of axes below is optional.]

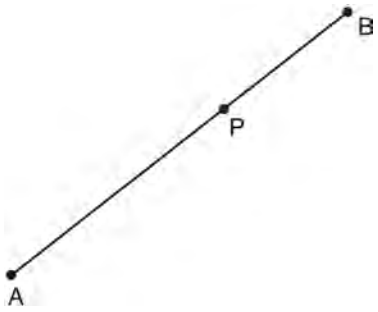


632 Given the true statement, "The medians of a triangle are concurrent," write the negation of the statement and give the truth value for the negation.

633 Write an equation for circle O shown on the graph below.



634 Using a compass and straightedge, construct a line perpendicular to $\overline{AB}$ through point P. [Leave all construction marks.]



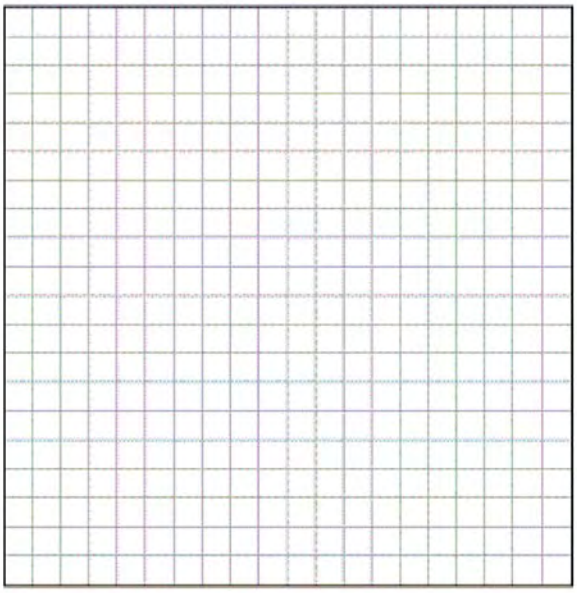
635 Two lines are represented by the equations $x + 2y = 4$ and $4y - 2x = 12$. Determine whether these lines are parallel, perpendicular, or neither. Justify your answer.

636 Using a compass and straightedge, construct a line that passes through point *P* and is perpendicular to line *m*. [Leave all construction marks.]

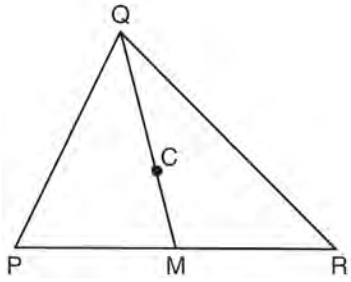
637 Tim has a rectangular prism with a length of 10 centimeters, a width of 2 centimeters, and an unknown height. He needs to build another rectangular prism with a length of 5 centimeters and the same height as the original prism. The volume of the two prisms will be the same. Find the width, in centimeters, of the new prism.

638 The coordinates of the endpoints of $\overline{BC}$ are $B(5,1)$ and $C(-3,-2)$. Under the transformation R_{90}, the image of $\overline{BC}$ is $\overline{B'C'}$. State the coordinates of points B' and C'.

639 Triangle *ABC* has vertices $A(-2,2)$, $B(-1,-3)$, and $C(4,0)$. Find the coordinates of the vertices of $\triangle A'B'C'$, the image of $\triangle ABC$ after the transformation $r_{x\text{-axis}}$. [The use of the grid is optional.]



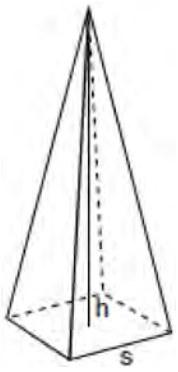
640 In the diagram below, $\overline{QM}$ is a median of triangle *PQR* and point *C* is the centroid of triangle *PQR*.



If $QC = 5x$ and $CM = x + 12$, determine and state the length of $\overline{QM}$.

641 State whether the lines represented by the equations $y = \frac{1}{2}x - 1$ and $y + 4 = -\frac{1}{2}(x - 2)$ are parallel, perpendicular, or neither. Explain your answer.

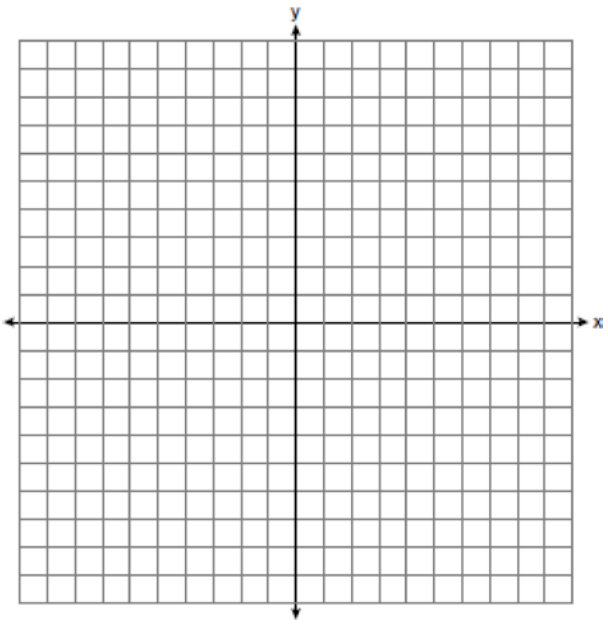
642 A regular pyramid with a square base is shown in the diagram below.



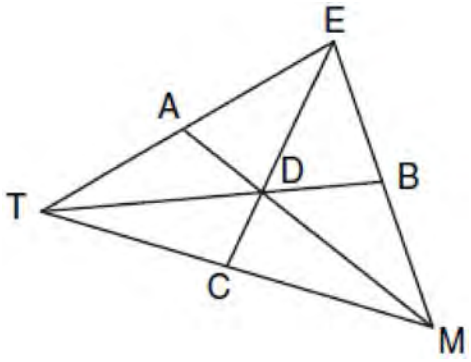
A side, *s*, of the base of the pyramid is 12 meters, and the height, *h*, is 42 meters. What is the volume of the pyramid in cubic meters?

643 Using a compass and straightedge, and $\overline{AB}$ below, construct an equilateral triangle with all sides congruent to $\overline{AB}$. [Leave all construction marks.]

644 On the set of axes below, graph the locus of points that are 4 units from the line $x = 3$ and the locus of points that are 5 units from the point $(0,2)$. Label with an **X** all points that satisfy both conditions.

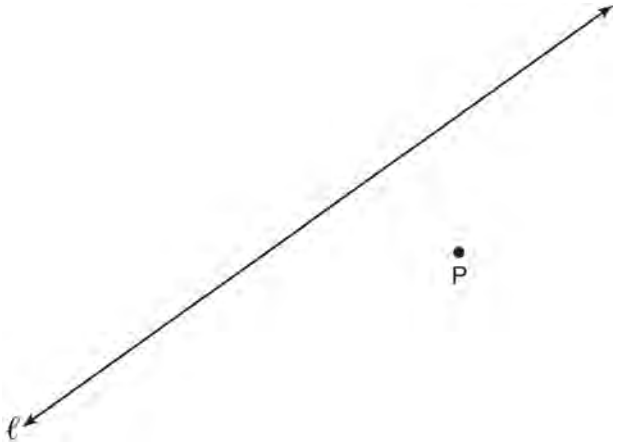


645 In the diagram below of $\triangle TEM$, medians $\overline{TB}$, $\overline{EC}$, and $\overline{MA}$ intersect at *D*, and $TB = 9$. Find the length of $\overline{TD}$.

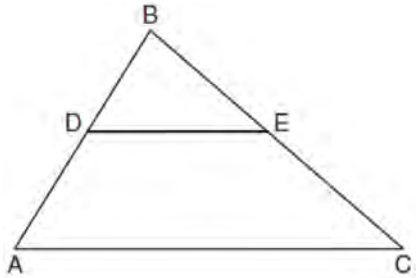


646 Write an equation of a circle whose center is $(-3,2)$ and whose diameter is 10.

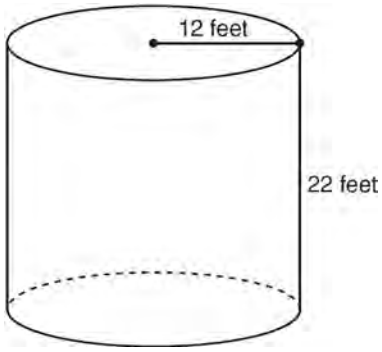
647 Using a compass and straightedge, construct a line perpendicular to line ℓ through point P. [Leave all construction marks.]



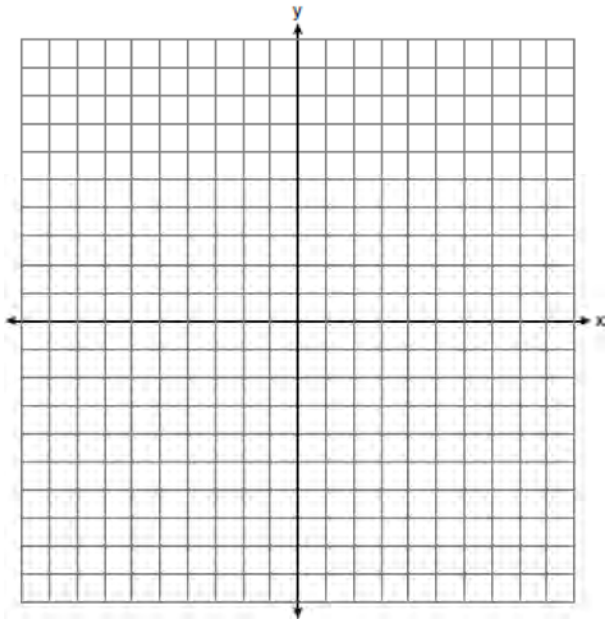
648 In the diagram below of $\triangle ABC$, $\overline{DE}$ is a midsegment of $\triangle ABC$, $DE = 7$, $AB = 10$, and $BC = 13$. Find the perimeter of $\triangle ABC$.



649 The cylindrical tank shown in the diagram below is to be painted. The tank is open at the top, and the bottom does *not* need to be painted. Only the outside needs to be painted. Each can of paint covers 600 square feet. How many cans of paint must be purchased to complete the job?

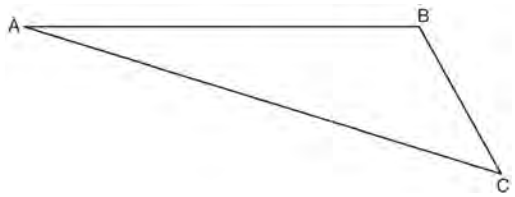


650 Write an equation of the line that is the perpendicular bisector of the line segment having endpoints $(3,-1)$ and $(3,5)$. [The use of the grid below is optional]

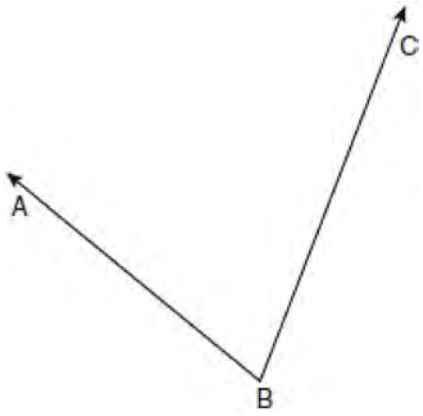


651 Find the slope of a line perpendicular to the line whose equation is $2y - 6x = 4$.

652 On the diagram of $\triangle ABC$ shown below, use a compass and straightedge to construct the perpendicular bisector of $\overline{AC}$. [Leave all construction marks.]

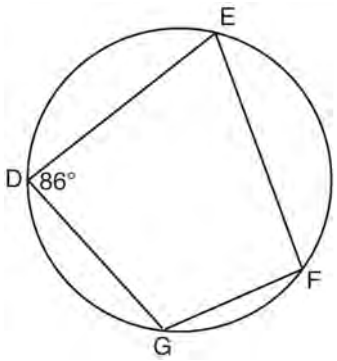


653 Using a compass and straightedge, construct the angle bisector of $\angle ABC$ shown below. [Leave all construction marks.]



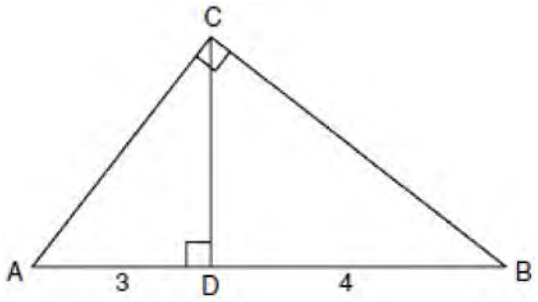
654 A cylinder has a height of 7 cm and a base with a diameter of 10 cm. Determine the volume, in cubic centimeters, of the cylinder in terms of π.

655 As shown in the diagram below, quadrilateral $DEFG$ is inscribed in a circle and $m\angle D = 86$.

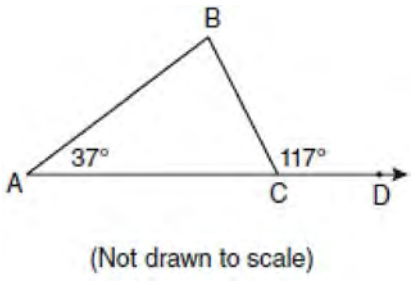


Determine and state $m\overset{\frown}{GFE}$. Determine and state $m\angle F$.

656 In the diagram below of right triangle ACB, altitude $\overline{CD}$ intersects $\overline{AB}$ at D. If $AD = 3$ and $DB = 4$, find the length of $\overline{CD}$ in simplest radical form.

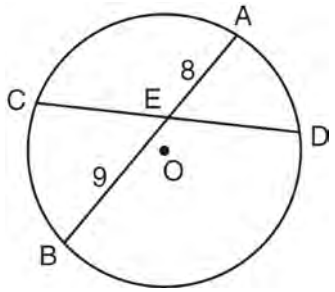


657 In the diagram below of $\triangle ABC$ with side $\overline{AC}$ extended through D, $m\angle A = 37$ and $m\angle BCD = 117$. Which side of $\triangle ABC$ is the longest side? Justify your answer.



(Not drawn to scale)

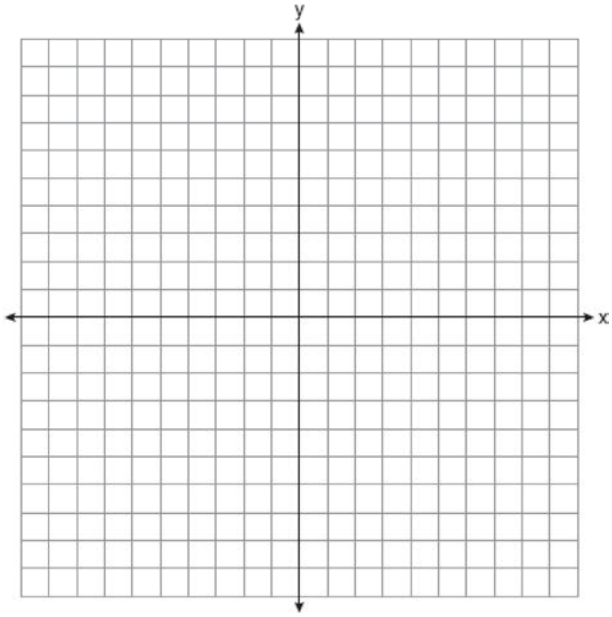
658 In the diagram below of circle O, chord $\overline{AB}$ bisects chord $\overline{CD}$ at E. If $AE = 8$ and $BE = 9$, find the length of $\overline{CE}$ in simplest radical form.



659 The endpoints of $\overline{PQ}$ are $P(-3,1)$ and $Q(4,25)$. Find the length of $\overline{PQ}$.

660 The sum of the interior angles of a regular polygon is 540°. Determine and state the number of degrees in one interior angle of the polygon.

661 Triangle ABC has coordinates $A(-2,1)$, $B(3,1)$, and $C(0,-3)$. On the set of axes below, graph and label $\triangle A'B'C'$, the image of $\triangle ABC$ after a dilation of 2.



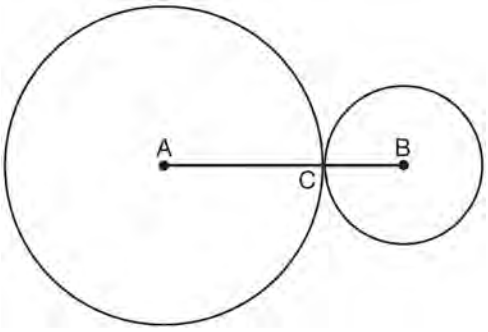
662 A right circular cylinder has a height of 7 inches and the base has a diameter of 6 inches. Determine the lateral area, in square inches, of the cylinder in terms of π.

663 Rectangle $KLMN$ has vertices $K(0,4)$, $L(4,2)$, $M(1,-4)$, and $N(-3,-2)$. Determine and state the coordinates of the point of intersection of the diagonals.

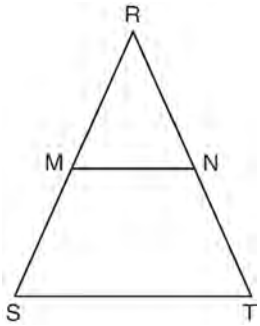
664 In the diagram below, car *A* is parked 7 miles from car *B*. Sketch the points that are 4 miles from car *A* and sketch the points that are 4 miles from car *B*. Label with an **X** all points that satisfy both conditions.

665 Triangle *ABC* has vertices at $A(3,0)$, $B(9,-5)$, and $C(7,-8)$. Find the length of $\overline{AC}$ in simplest radical form.

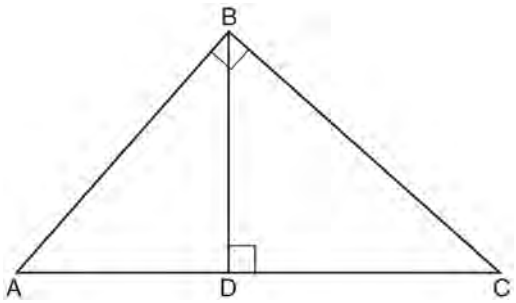
666 In the diagram below, circles *A* and *B* are tangent at point *C* and $\overline{AB}$ is drawn. Sketch all common tangent lines.



667 In isosceles triangle *RST* shown below, $\overline{RS} \cong \overline{RT}$, *M* and *N* are midpoints of $\overline{RS}$ and $\overline{RT}$, respectively, and $\overline{MN}$ is drawn. If $MN = 3.5$ and the perimeter of $\triangle RST$ is 25, determine and state the length of $\overline{NT}$.



668 In right triangle *ABC* shown below, altitude $\overline{BD}$ is drawn to hypotenuse $\overline{AC}$.

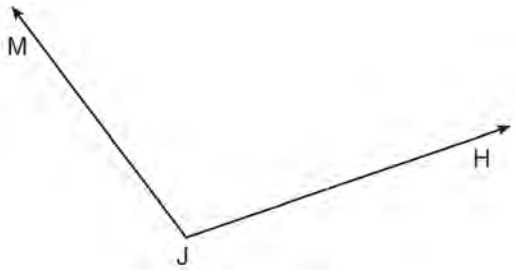


If $AD = 8$ and $DC = 10$, determine and state the length of $\overline{AB}$.

669 The coordinates of two vertices of square *ABCD* are $A(2,1)$ and $B(4,4)$. Determine the slope of side $\overline{BC}$.

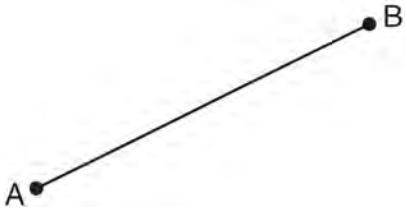
670 The length of $\overline{AB}$ is 3 inches. On the diagram below, sketch the points that are equidistant from A and B and sketch the points that are 2 inches from A. Label with an **X** all points that satisfy both conditions.

671 Using a compass and straightedge, construct the bisector of $\angle MJH$. [Leave all construction marks.]



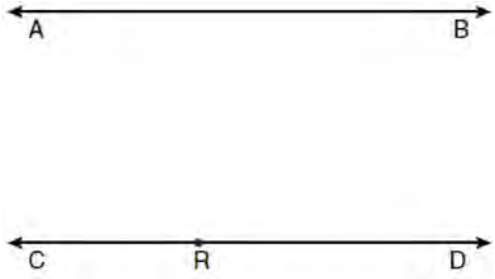
672 Write an equation of a line that is parallel to the line whose equation is $3y = x + 6$ and that passes through the point $(-3, 4)$.

673 Using a compass and straightedge, locate the midpoint of $\overline{AB}$ by construction. [Leave all construction marks.]

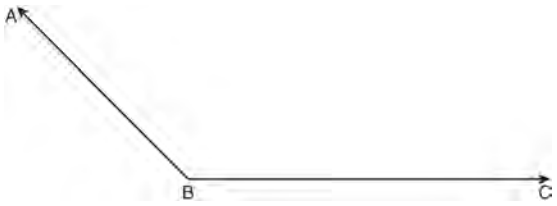


674 A sphere has a diameter of 18 meters. Find the volume of the sphere, in cubic meters, in terms of π.

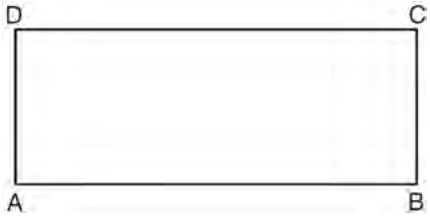
675 Two lines, $\overleftrightarrow{AB}$ and $\overleftrightarrow{CRD}$, are parallel and 10 inches apart. Sketch the locus of all points that are equidistant from $\overleftrightarrow{AB}$ and $\overleftrightarrow{CRD}$ and 7 inches from point *R*. Label with an **X** each point that satisfies both conditions.

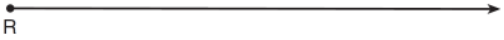


676 On the diagram below, use a compass and straightedge to construct the bisector of $\angle ABC$. [Leave all construction marks.]

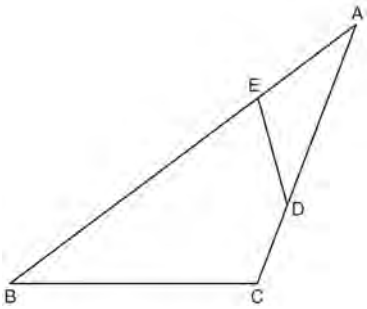


677 On the ray drawn below, using a compass and straightedge, construct an equilateral triangle with a vertex at *R*. The length of a side of the triangle must be equal to a length of the diagonal of rectangle *ABCD*.

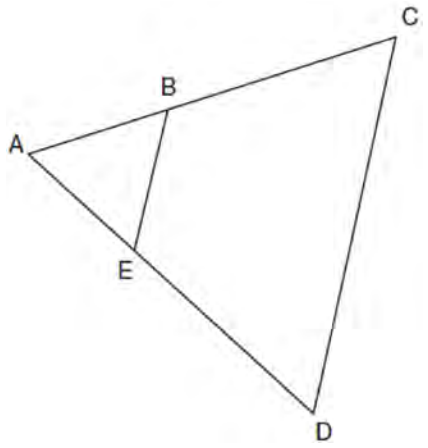




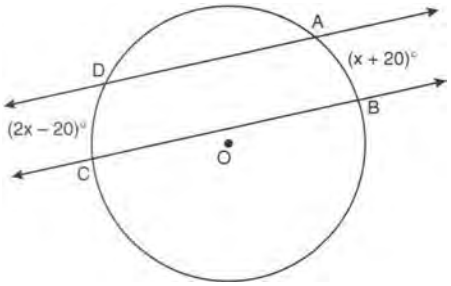
678 The diagram below shows $\triangle ABC$, with $\overline{AEB}$, $\overline{ADC}$, and $\angle ACB \cong \angle AED$. Prove that $\triangle ABC$ is similar to $\triangle ADE$.



679 In the diagram below of $\triangle ACD$, E is a point on $\overline{AD}$ and B is a point on $\overline{AC}$, such that $\overline{EB} \parallel \overline{DC}$. If $AE = 3$, $ED = 6$, and $DC = 15$, find the length of $\overline{EB}$.



680 In the diagram below, two parallel lines intersect circle O at points A, B, C, and D, with $m\overset{\frown}{AB} = x + 20$ and $m\overset{\frown}{DC} = 2x - 20$. Find $m\overset{\frown}{AB}$.



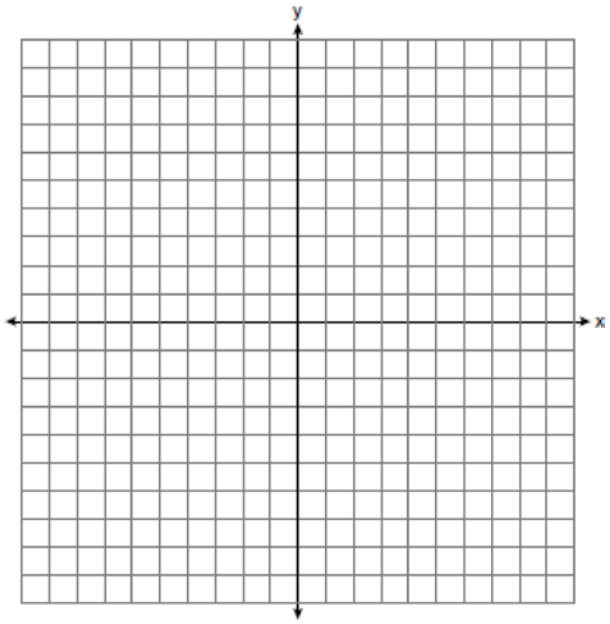
681 Find, in simplest radical form, the length of the line segment with endpoints whose coordinates are $(-1, 4)$ and $(3, -2)$.

682 In right $\triangle DEF$, $m\angle D = 90$ and $m\angle F$ is 12 degrees less than twice $m\angle E$. Find $m\angle E$.

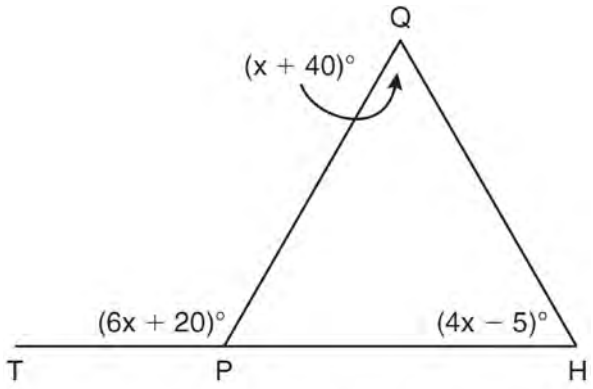
683 The volume of a cylinder is 12,566.4 cm^3. The height of the cylinder is 8 cm. Find the radius of the cylinder to the *nearest tenth of a centimeter*.

684 The image of $\triangle ABC$ under a translation is $\triangle A'B'C'$. Under this translation, $B(3, -2)$ maps onto $B'(1, -1)$. Using this translation, the coordinates of image A' are $(-2, 2)$. Determine and state the coordinates of point A.

685 On the set of axes below, graph the locus of points 4 units from the x-axis and equidistant from the points whose coordinates are $(-2, 0)$ and $(8, 0)$. Mark with an **X** all points that satisfy *both* conditions.

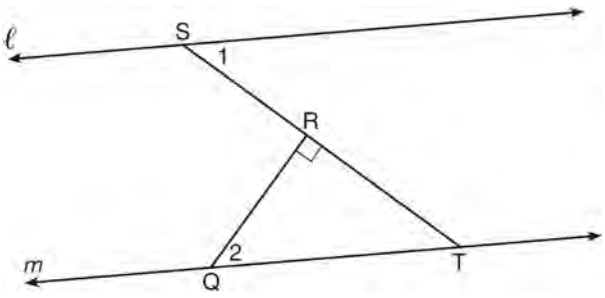


686 In the diagram below of $\triangle HQP$, side $\overline{HP}$ is extended through P to T, $m\angle QPT = 6x + 20$, $m\angle HQP = x + 40$, and $m\angle PHQ = 4x - 5$. Find $m\angle QPT$.



(Not drawn to scale)

687 In the diagram below, $\ell \parallel m$ and $\overline{QR} \perp \overline{ST}$ at R.



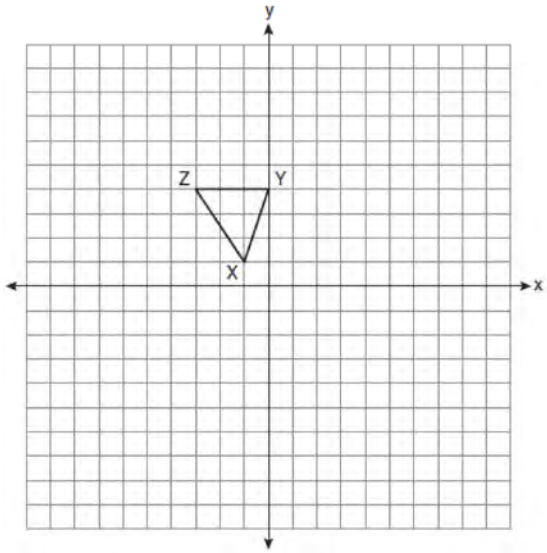
If $m\angle 1 = 63$, find $m\angle 2$.

688 Write an equation of the line that passes through the point $(6,-5)$ and is parallel to the line whose equation is $2x - 3y = 11$.

689 The measures of the angles of a triangle are in the ratio $5:6:7$. Determine the measure, in degrees, of the *smallest* angle of the triangle.

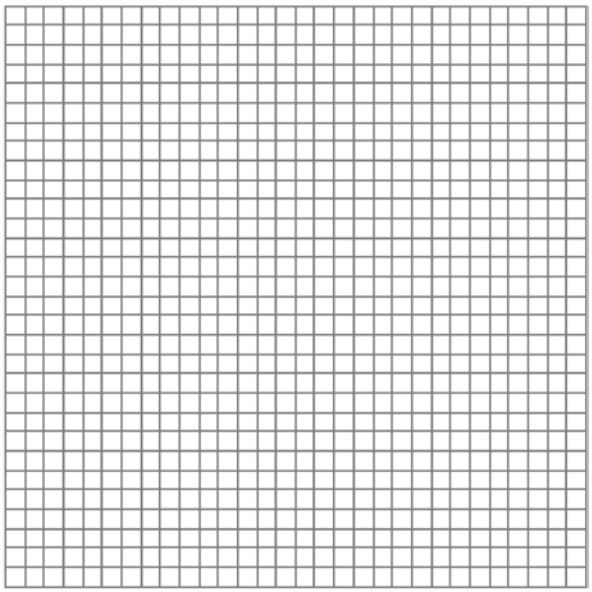
690 After the transformation $r_{y=x}$, the image of $\triangle ABC$ is $\triangle A'B'C'$. If $AB = 2x + 13$ and $A'B' = 9x - 8$, find the value of x.

691 Triangle XYZ, shown in the diagram below, is reflected over the line $x = 2$. State the coordinates of $\triangle X'Y'Z'$, the image of $\triangle XYZ$.

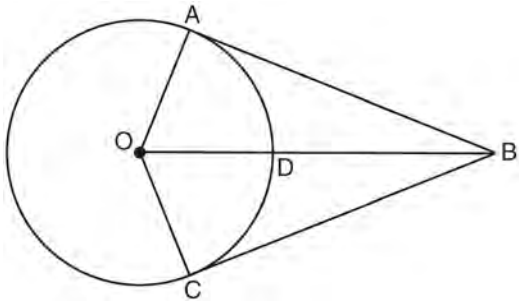


692 Find, in degrees, the measures of both an interior angle and an exterior angle of a regular pentagon.

693 The vertices of $\triangle ABC$ are $A(3,2)$, $B(6,1)$, and $C(4,6)$. Identify and graph a transformation of $\triangle ABC$ such that its image, $\triangle A'B'C'$, results in $\overline{AB} \parallel \overline{A'B'}$.

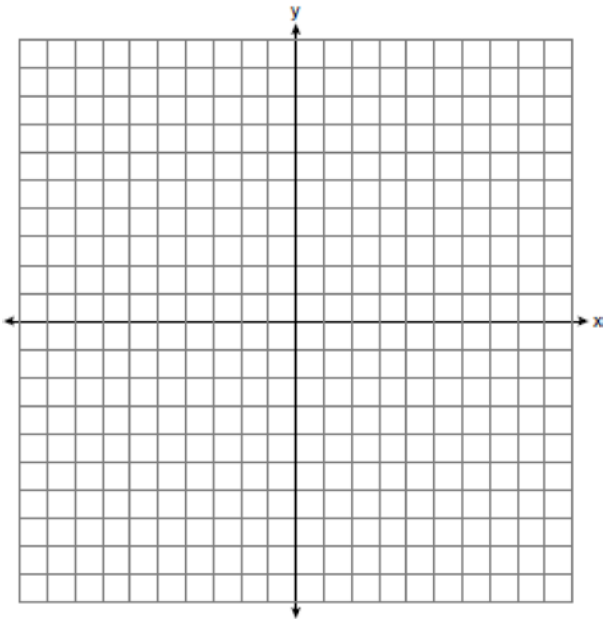


694 As shown in the diagram below, $\overline{BO}$ and tangents $\overline{BA}$ and $\overline{BC}$ are drawn from external point B to circle O. Radii $\overline{OA}$ and $\overline{OC}$ are drawn.

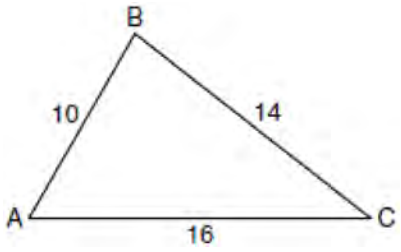


If $OA = 7$ and $DB = 18$, determine and state the length of $\overline{AB}$.

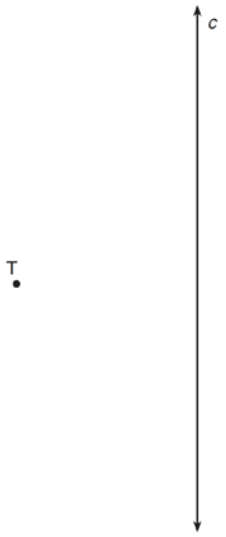
695 On the set of axes below, graph the locus of points 4 units from $(0,1)$ and the locus of points 3 units from the origin. Label with an **X** *any* points that satisfy *both* conditions.



696 In the diagram of $\triangle ABC$ below, $AB = 10$, $BC = 14$, and $AC = 16$. Find the perimeter of the triangle formed by connecting the midpoints of the sides of $\triangle ABC$.



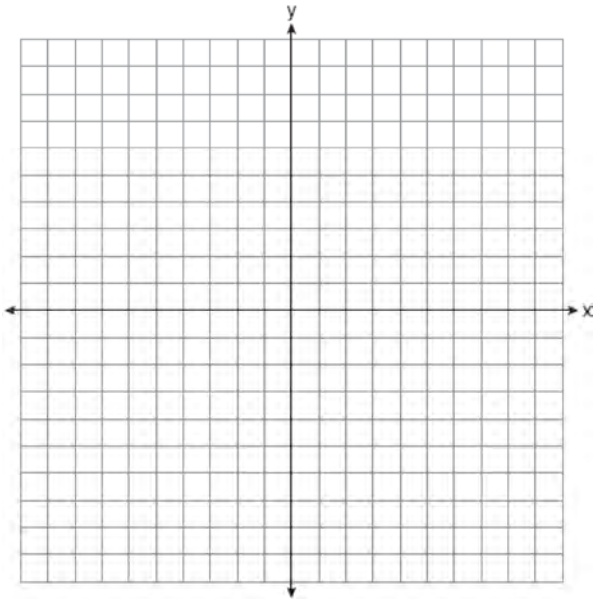
697 A tree, *T*, is 6 meters from a row of corn, *c*, as represented in the diagram below. A farmer wants to place a scarecrow 2 meters from the row of corn and also 5 meters from the tree. Sketch both loci. Indicate, with an **X**, all possible locations for the scarecrow.



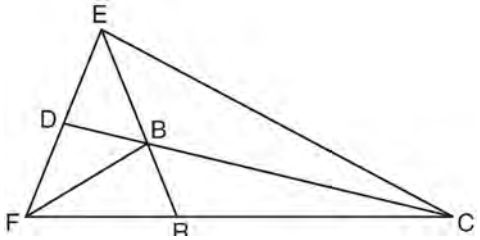
698 Determine, in degrees, the measure of each interior angle of a regular octagon.

699 A paper container in the shape of a right circular cone has a radius of 3 inches and a height of 8 inches. Determine and state the number of cubic inches in the volume of the cone, in terms of π.

700 Triangle *ABC* has vertices $A(-1,1)$, $B(1,3)$, and $C(4,1)$. The image of $\triangle ABC$ after the transformation $r_{y=x}$ is $\triangle A'B'C'$. State and label the coordinates of $\triangle A'B'C'$. [The use of the set of axes below is optional.]



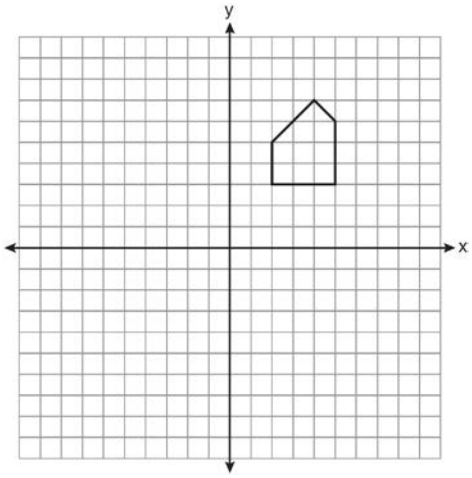
701 In the diagram below, point *B* is the incenter of $\triangle FEC$, and $\overline{EBR}$, $\overline{CBD}$, and $\overline{FB}$ are drawn.



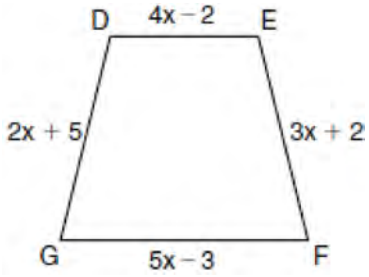
If $m\angle FEC = 84$ and $m\angle ECF = 28$, determine and state $m\angle BRC$.

702 The slope of $\overline{QR}$ is $\frac{x-1}{4}$ and the slope of $\overline{ST}$ is $\frac{8}{3}$. If $\overline{QR} \perp \overline{ST}$, determine and state the value of x.

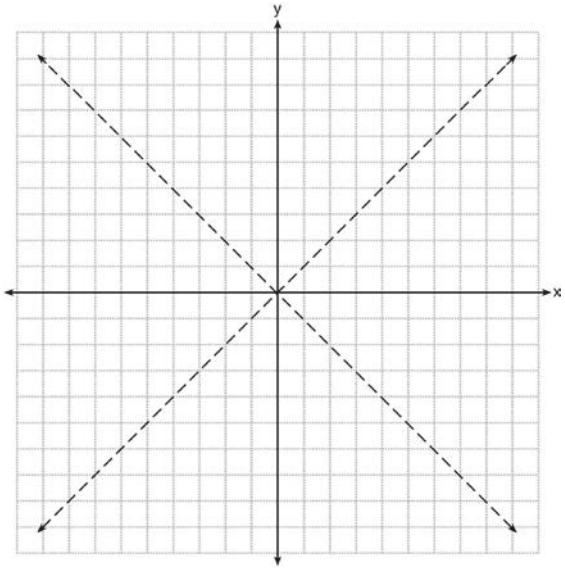
703 A pentagon is drawn on the set of axes below. If the pentagon is reflected over the y-axis, determine if this transformation is an isometry. Justify your answer. [The use of the set of axes is optional.]



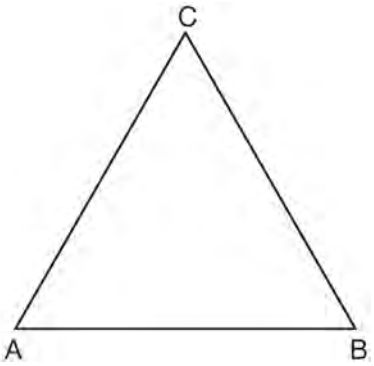
704 In the diagram below of isosceles trapezoid $DEFG$, $\overline{DE} \parallel \overline{GF}$, $DE = 4x - 2$, $EF = 3x + 2$, $FG = 5x - 3$, and $GD = 2x + 5$. Find the value of x.



705 The graph below shows the locus of points equidistant from the x-axis and y-axis. On the same set of axes, graph the locus of points 3 units from the line $x = 0$. Label with an **X** *all* points that satisfy both conditions.

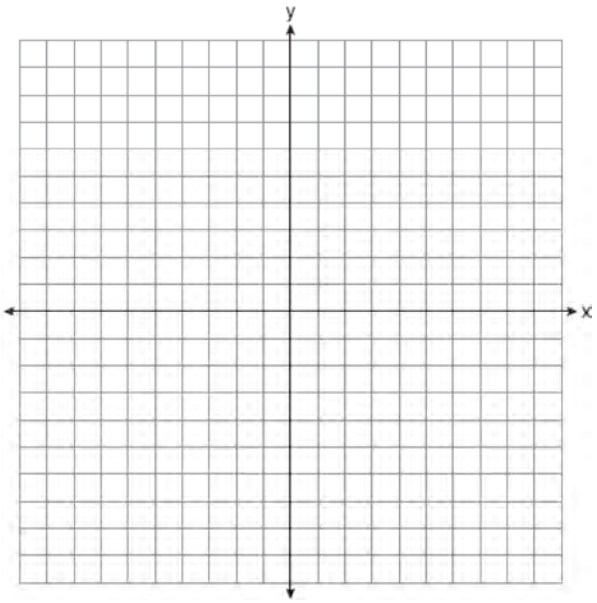


706 In the diagram below, $\triangle ABC$ is equilateral.

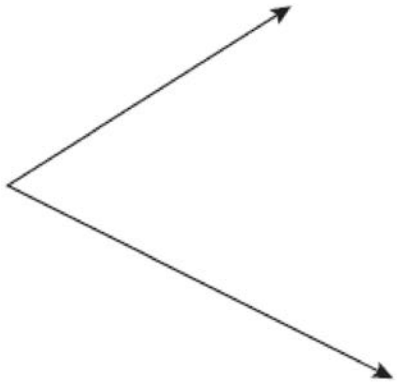


Using a compass and straightedge, construct a new equilateral triangle congruent to $\triangle ABC$ in the space below. [Leave all construction marks.]

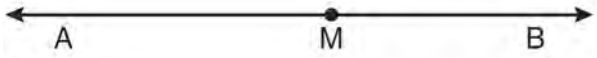
707 Triangle TAP has coordinates $T(-1,4)$, $A(2,4)$, and $P(2,0)$. On the set of axes below, graph and label $\triangle T'A'P'$, the image of $\triangle TAP$ after the translation $(x,y) \rightarrow (x-5, y-1)$.



708 Using a compass and straightedge, construct the bisector of the angle shown below. [*Leave all construction marks*.]

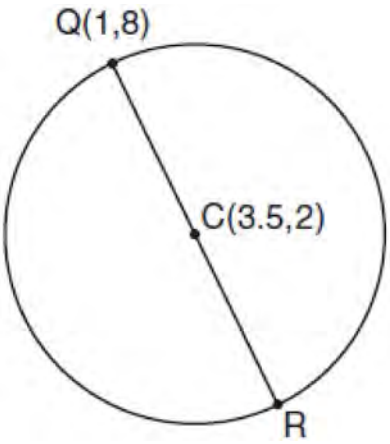


709 In the diagram below, point M is located on $\overleftrightarrow{AB}$. Sketch the locus of points that are 1 unit from $\overleftrightarrow{AB}$ and the locus of points 2 units from point M. Label with an **X** all points that satisfy both conditions.

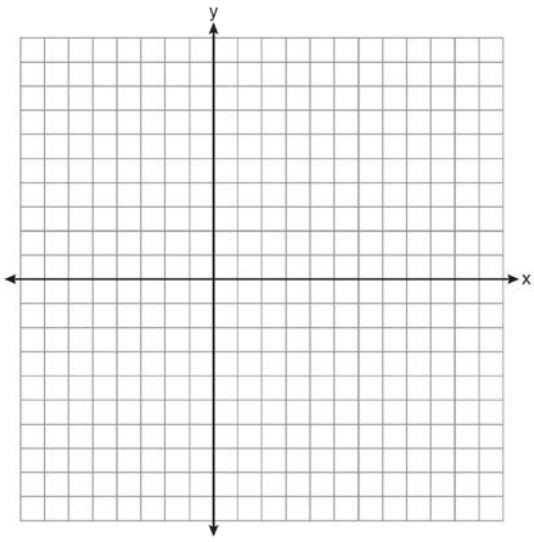


710 On the line segment below, use a compass and straightedge to construct equilateral triangle ABC. [Leave all construction marks.]

711 In the diagram below of circle C, $\overline{QR}$ is a diameter, and $Q(1,8)$ and $C(3.5,2)$ are points on a coordinate plane. Find and state the coordinates of point R.



712 Triangle ABC has vertices $A(3,3)$, $B(7,9)$, and $C(11,3)$. Determine the point of intersection of the medians, and state its coordinates. [The use of the set of axes below is optional.]

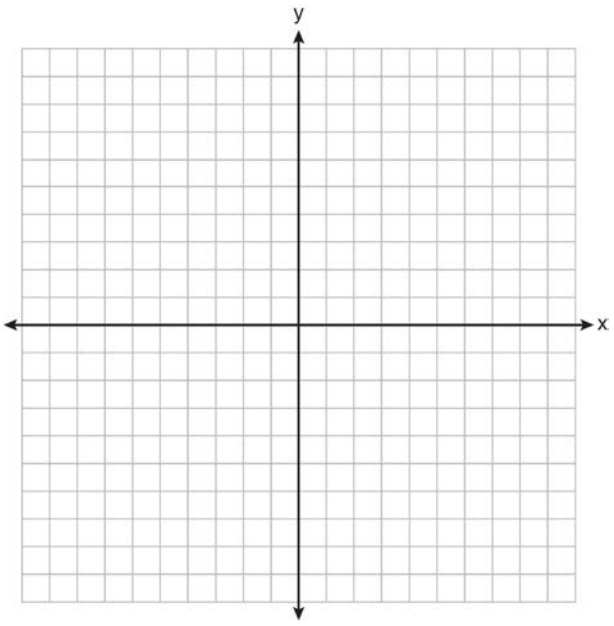


713 Given: Two is an even integer or three is an even integer.
Determine the truth value of this disjunction.
Justify your answer.

714 The diameter of a sphere is 5 inches. Determine and state the surface area of the sphere, to the *nearest hundredth of a square inch*.

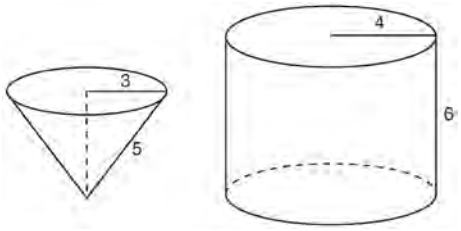
Geometry 4 Point Regents Exam Questions

715 Triangle ABC has coordinates $A(2,-2)$, $B(2,1)$, and $C(4,-2)$. Triangle $A'B'C'$ is the image of $\triangle ABC$ under $T_{5,-2}$. On the set of axes below, graph and label $\triangle ABC$ and its image, $\triangle A'B'C'$. Determine the relationship between the area of $\triangle ABC$ and the area of $\triangle A'B'C'$. Justify your response.



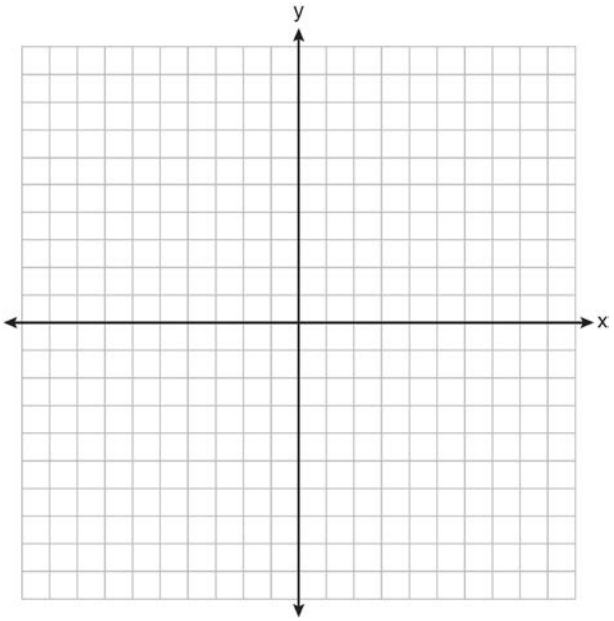
716 A paint can is in the shape of a right circular cylinder. The volume of the paint can is 600π cubic inches and its altitude is 12 inches. Find the radius, in inches, of the base of the paint can. Express the answer in simplest radical form. Find, to the *nearest tenth of a square inch*, the lateral area of the paint can.

717 In the diagram below, a right circular cone with a radius of 3 inches has a slant height of 5 inches, and a right cylinder with a radius of 4 inches has a height of 6 inches.

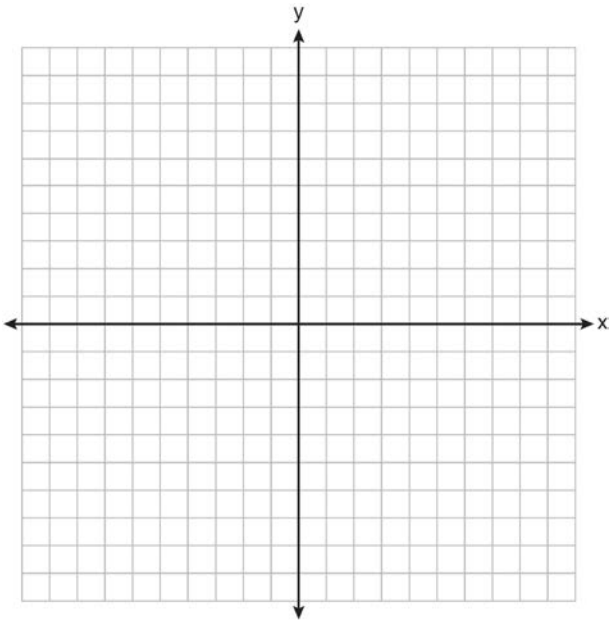


Determine and state the number of full cones of water needed to completely fill the cylinder with water.

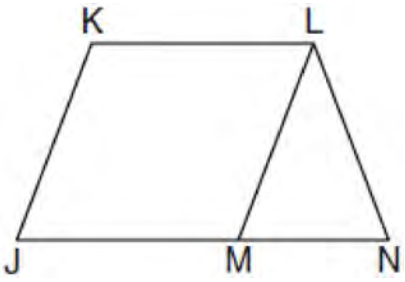
718 On the set of axes below, graph the locus of points that are four units from the point $(2,1)$. On the same set of axes, graph the locus of points that are two units from the line $x = 4$. State the coordinates of all points that satisfy both conditions.



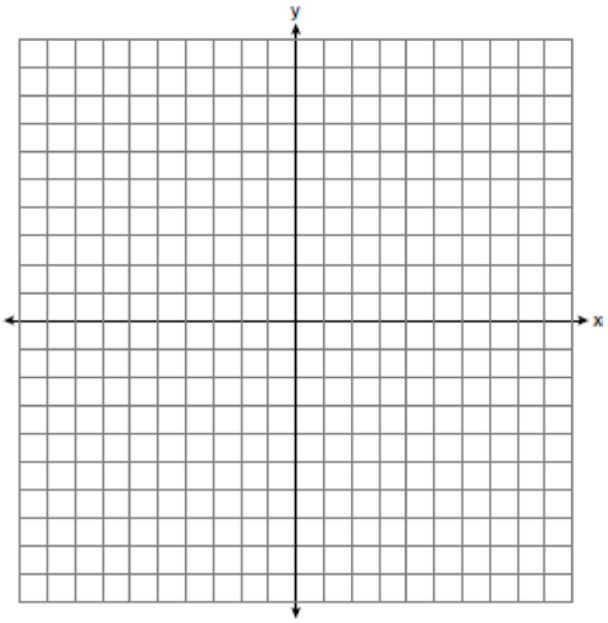
719 On the set of axes below, graph and label $\triangle DEF$ with vertices at $D(-4,-4)$, $E(-2,2)$, and $F(8,-2)$. If G is the midpoint of $\overline{EF}$ and H is the midpoint of $\overline{DF}$, state the coordinates of G and H and label each point on your graph. Explain why $\overline{GH} \parallel \overline{DE}$.



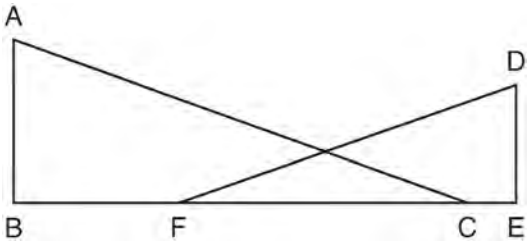
720 Given: $JKLM$ is a parallelogram.
$\overline{JM} \cong \overline{LN}$
$\angle LMN \cong \angle LNM$
Prove: $JKLM$ is a rhombus.



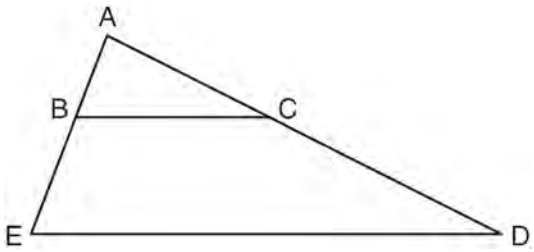
721 On the set of axes below, graph the locus of points 5 units from the point $(2,-3)$ and the locus of points 2 units from the line whose equation is $y = -1$. State the coordinates of all points that satisfy *both* conditions.



722 In the diagram below, $\overline{BFCE}$, $\overline{AB} \perp \overline{BE}$, $\overline{DE} \perp \overline{BE}$, and $\angle BFD \cong \angle ECA$. Prove that $\triangle ABC \sim \triangle DEF$.



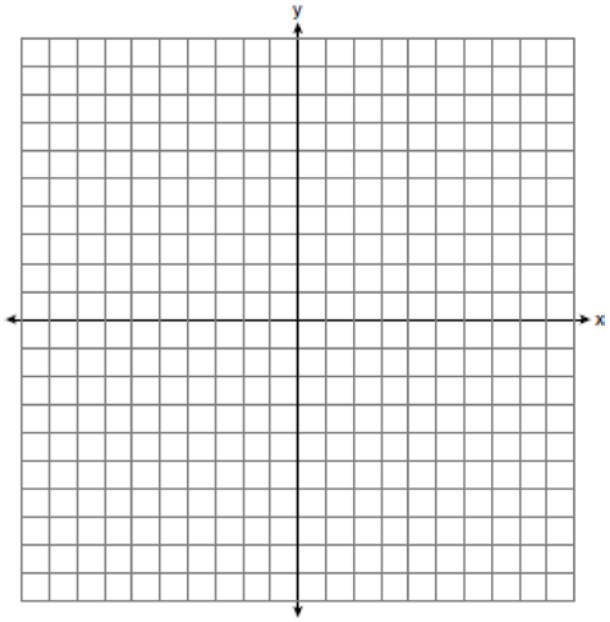
723 In the diagram below of $\triangle ADE$, B is a point on $\overline{AE}$ and C is a point on $\overline{AD}$ such that $\overline{BC} \parallel \overline{ED}$, $AC = x - 3$, $BE = 20$, $AB = 16$, and $AD = 2x + 2$. Find the length of $\overline{AC}$.



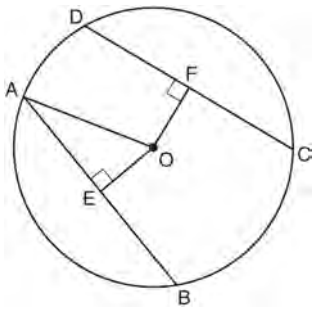
724 Solve the following system of equations graphically.

$$2x^2 - 4x = y + 1$$

$$x + y = 1$$

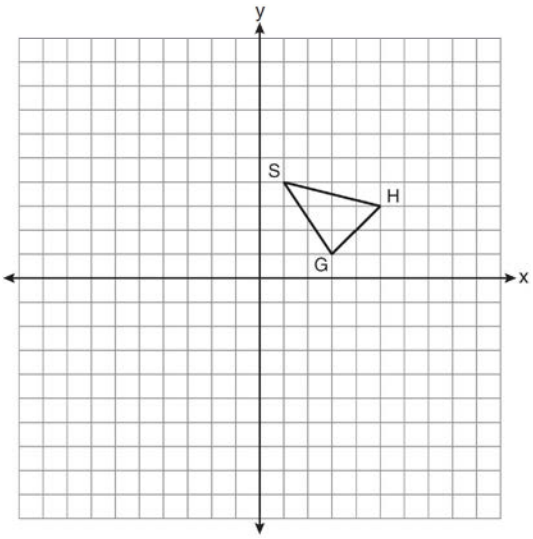


725 In circle O shown below, chords $\overline{AB}$ and $\overline{CD}$ and radius $\overline{OA}$ are drawn, such that $\overline{AB} \cong \overline{CD}$, $\overline{OE} \perp \overline{AB}$, $\overline{OF} \perp \overline{CD}$, $OF = 16$, $CF = y + 10$, and $CD = 4y - 20$.

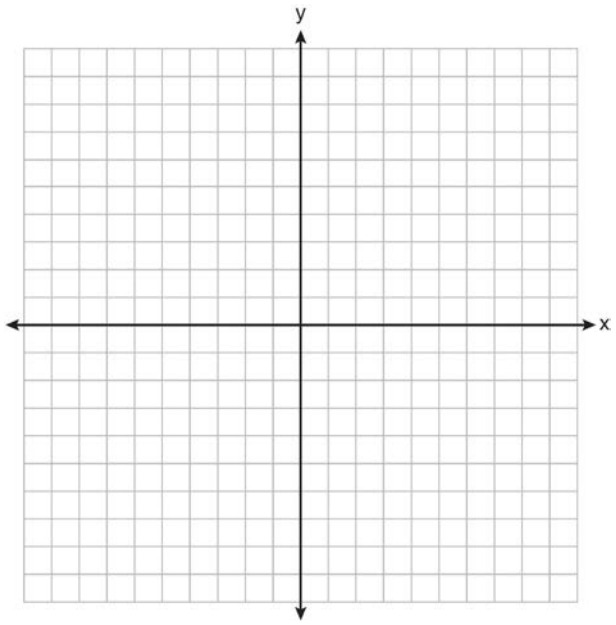


Determine the length of $\overline{DF}$. Determine the length of $\overline{OA}$.

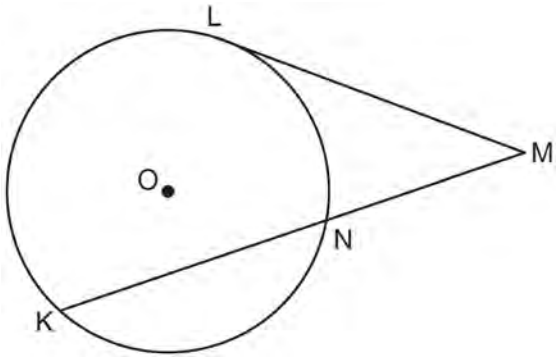
726 As shown on the set of axes below, $\triangle GHS$ has vertices $G(3,1)$, $H(5,3)$, and $S(1,4)$. Graph and state the coordinates of $\triangle G''H''S''$, the image of $\triangle GHS$ after the transformation $T_{-3,1} \circ D_2$.



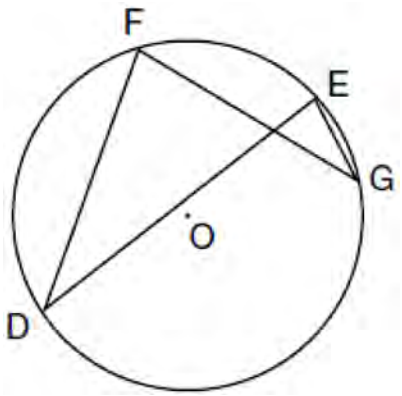
727 A city is planning to build a new park. The park must be equidistant from school A at $(3,3)$ and school B at $(3,-5)$. The park also must be exactly 5 miles from the center of town, which is located at the origin on the coordinate graph. Each unit on the graph represents 1 mile. On the set of axes below, sketch the compound loci and label with an **X** all possible locations for the new park.



728 In the diagram below, tangent $\overline{ML}$ and secant $\overline{MNK}$ are drawn to circle O. The ratio $m\overset{\frown}{LN} : m\overset{\frown}{NK} : m\overset{\frown}{KL}$ is $3:4:5$. Find $m\angle LMK$.



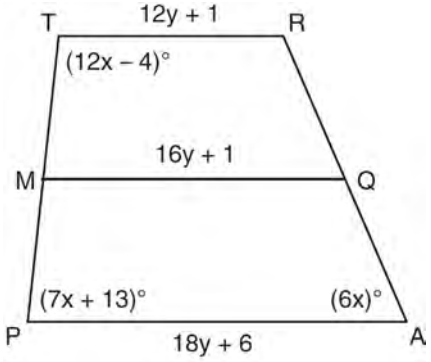
729 In the diagram below of circle O, chords $\overline{DF}$, $\overline{DE}$, $\overline{FG}$, and $\overline{EG}$ are drawn such that $m\overset{\frown}{DF} : m\overset{\frown}{FE} : m\overset{\frown}{EG} : m\overset{\frown}{GD} = 5:2:1:7$. Identify one pair of inscribed angles that are congruent to each other and give their measure.



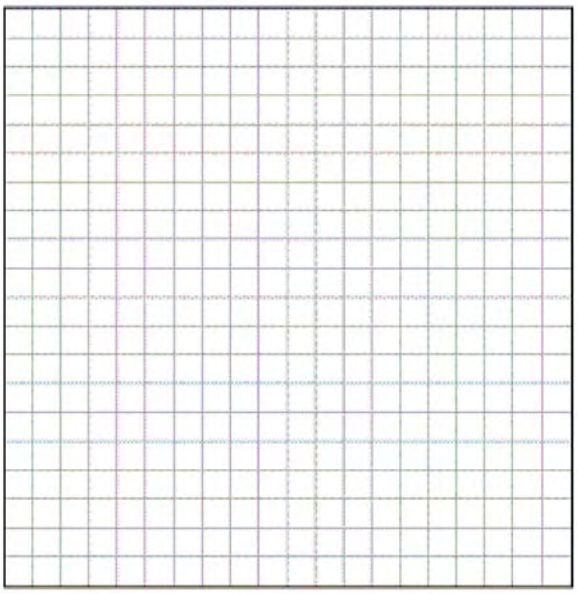
730 Using a compass and straightedge, construct an equilateral triangle with $\overline{AB}$ as a side. Using this triangle, construct a 30° angle with its vertex at A. [Leave all construction marks.]

731 In $\triangle ABC$, $m\angle A = x^2 + 12$, $m\angle B = 11x + 5$, and $m\angle C = 13x - 17$. Determine the longest side of $\triangle ABC$.

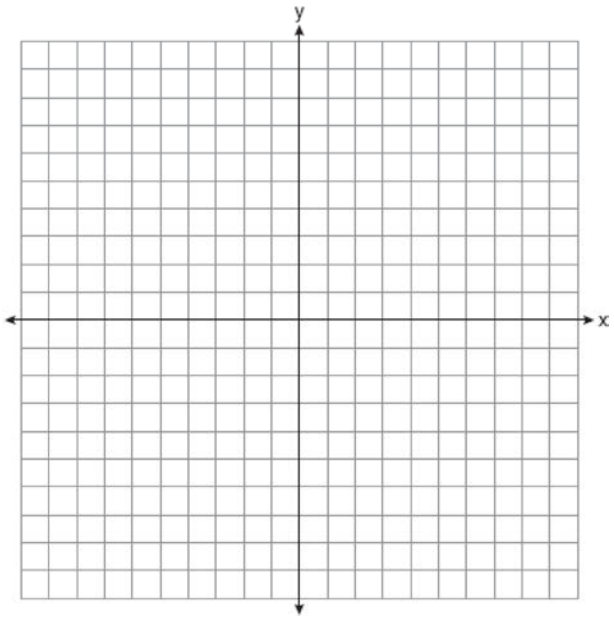
732 Trapezoid *TRAP*, with median $\overline{MQ}$, is shown in the diagram below. Solve algebraically for *x* and *y*.



733 On the grid below, graph the points that are equidistant from both the *x* and *y* axes and the points that are 5 units from the origin. Label with an **X** all points that satisfy *both* conditions.



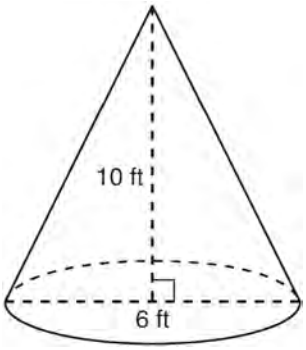
734 The coordinates of the vertices of $\triangle ABC$ are $A(-6,5)$, $B(-4,8)$, and $C(1,6)$. State and label the coordinates of the vertices of $\triangle A''B''C''$, the image of $\triangle ABC$ after the composition of transformations $T_{(4,-5)} \circ r_{y\text{-axis}}$. [The use of the set of axes below is optional.]



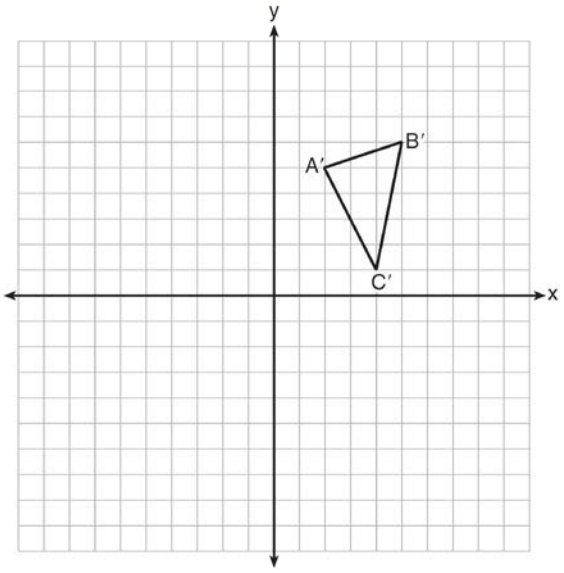
735 In $\triangle KLM$, $m\angle K = 36$ and $KM = 5$. The transformation D_2 is performed on $\triangle KLM$ to form $\triangle K'L'M'$. Find $m\angle K'$. Justify your answer. Find the length of $\overline{K'M'}$. Justify your answer.

736 Given: Quadrilateral *ABCD* with $\overline{AB} \cong \overline{CD}$, $\overline{AD} \cong \overline{BC}$, and diagonal $\overline{BD}$ is drawn
Prove: $\angle BDC \cong \angle ABD$

737 A right circular cone has an altitude of 10 ft and the diameter of the base is 6 ft as shown in the diagram below. Determine and state the lateral area of the cone, to the *nearest tenth of a square foot*.



738 The graph below shows $\triangle A'B'C'$, the image of $\triangle ABC$ after it was reflected over the *y*-axis. Graph and label $\triangle ABC$, the pre-image of $\triangle A'B'C'$. Graph and label $\triangle A''B''C''$, the image of $\triangle A'B'C'$ after it is reflected through the origin. State a single transformation that will map $\triangle ABC$ onto $\triangle A''B''C''$.

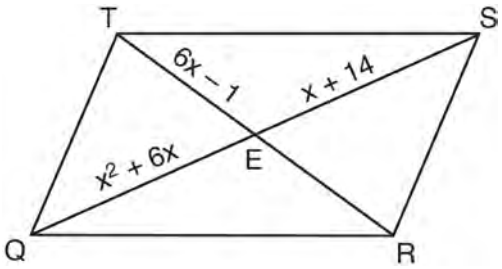


739 A right circular cylinder with a height of 5 cm has a base with a diameter of 6 cm. Find the lateral area of the cylinder to the *nearest hundredth of a square centimeter*. Find the volume of the cylinder to the *nearest hundredth of a cubic centimeter*.

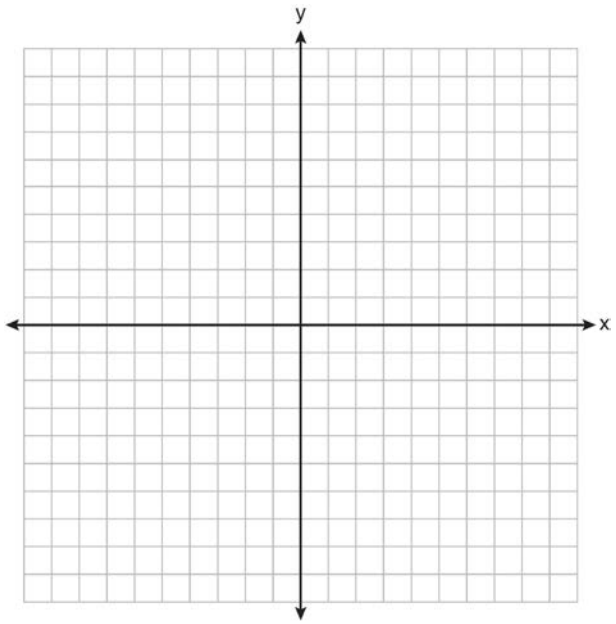
740 In parallelogram *ABCD*, with diagonal $\overline{AC}$ drawn, $m\angle BCA = 4x + 2$, $m\angle DAC = 6x - 6$, $m\angle BAC = 5y - 1$, and $m\angle DCA = 7y - 15$. Determine $m\angle B$.

741 Use a compass and straightedge to divide line segment *AB* below into four congruent parts. [Leave all construction marks.]

742 As shown in the diagram below, the diagonals of parallelogram *QRST* intersect at *E*. If $QE = x^2 + 6x$, $SE = x + 14$, and $TE = 6x - 1$, determine *TE* algebraically.



743 On the set of axes below, sketch the points that are 5 units from the origin and sketch the points that are 2 units from the line $y = 3$. Label with an **X** all points that satisfy both conditions.

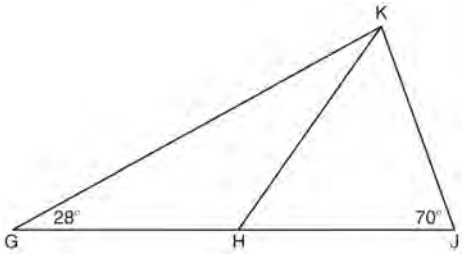


744 If $\triangle RST \sim \triangle ABC$, $m\angle A = x^2 - 8x$, $m\angle C = 4x - 5$, and $m\angle R = 5x + 30$, find $m\angle C$. [Only an algebraic solution can receive full credit.]

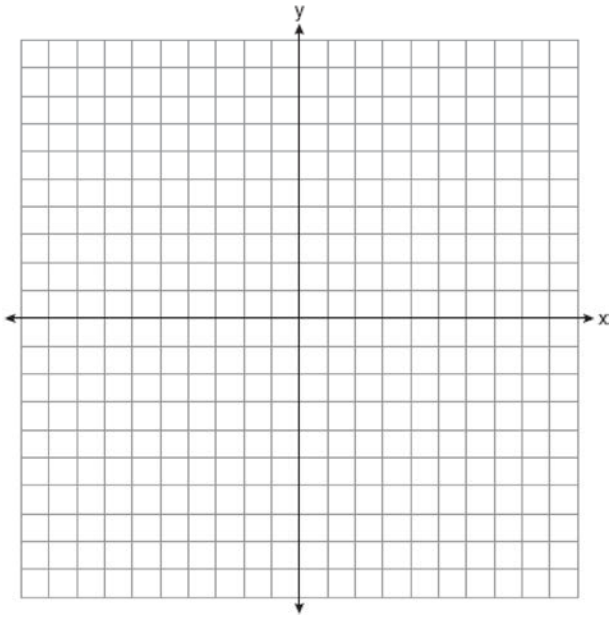
745 Find an equation of the line passing through the point $(6,5)$ and perpendicular to the line whose equation is $2y + 3x = 6$.

746 If $\overline{AB}$ is defined by the endpoints $A(4,2)$ and $B(8,6)$, write an equation of the line that is the perpendicular bisector of $\overline{AB}$.

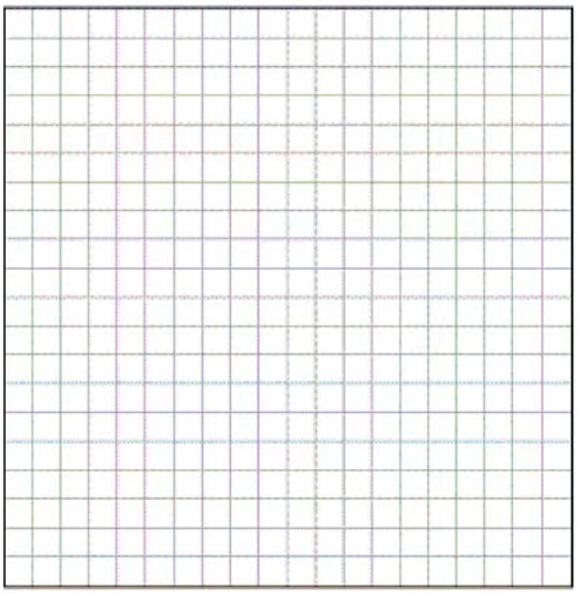
747 In the diagram below of $\triangle GJK$, H is a point on $\overline{GJ}$, $\overline{HJ} \cong \overline{JK}$, $m\angle G = 28$, and $m\angle GJK = 70$. Determine whether $\triangle GHK$ is an isosceles triangle and justify your answer.



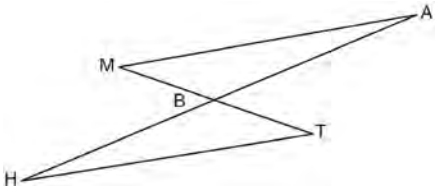
748 The coordinates of trapezoid $ABCD$ are $A(-4,5)$, $B(1,5)$, $C(1,2)$, and $D(-6,2)$. Trapezoid $A''B''C''D''$ is the image after the composition $r_{x-\text{axis}} \circ r_{y=x}$ is performed on trapezoid $ABCD$. State the coordinates of trapezoid $A''B''C''D''$. [The use of the set of axes below is optional.]



749 Write an equation of the circle whose diameter $\overline{AB}$ has endpoints $A(-4,2)$ and $B(4,-4)$. [The use of the grid below is optional.]

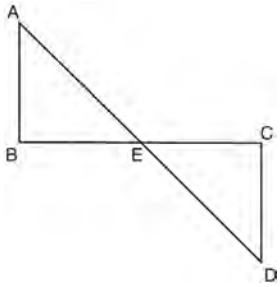


750 Given: $\overline{MT}$ and $\overline{HA}$ intersect at B, $\overline{MA} \parallel \overline{HT}$, and $\overline{MT}$ bisects $\overline{HA}$.

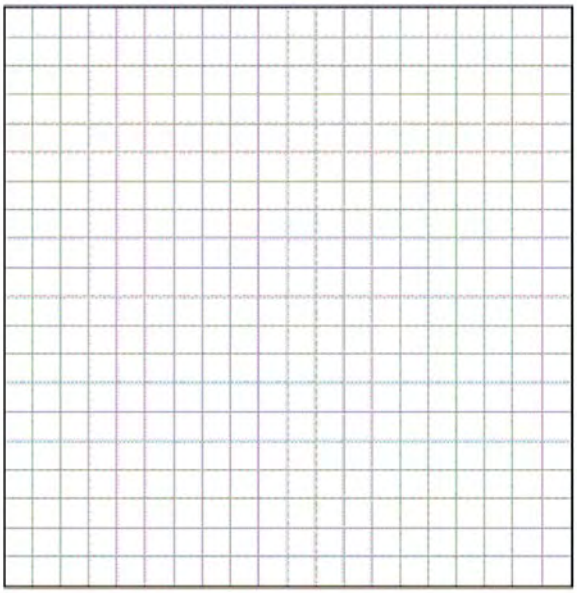


Prove: $\overline{MA} \cong \overline{HT}$

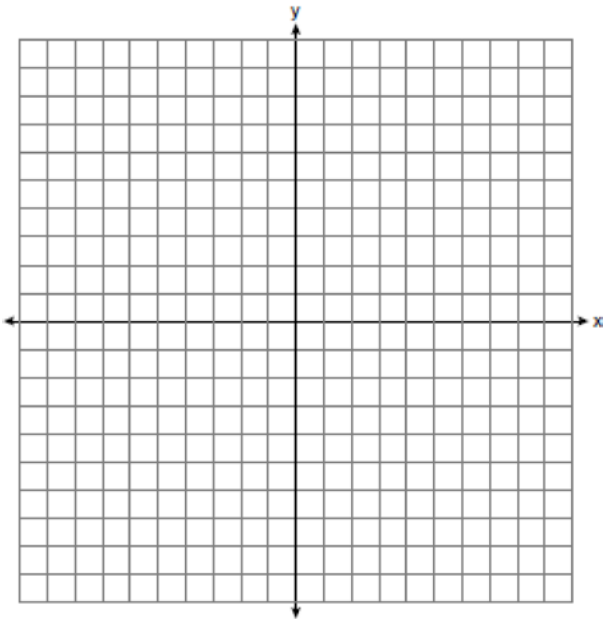
751 Given: $\overline{AD}$ bisects $\overline{BC}$ at E.
$\overline{AB} \perp \overline{BC}$
$\overline{DC} \perp \overline{BC}$
Prove: $\overline{AB} \cong \overline{DC}$



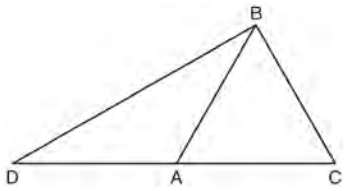
752 Write an equation of the perpendicular bisector of the line segment whose endpoints are $(-1,1)$ and $(7,-5)$. [The use of the grid below is optional]



753 On the set of axes below, sketch the locus of points 2 units from the x-axis and sketch the locus of points 6 units from the point $(0,4)$. Label with an **X** all points that satisfy both conditions.

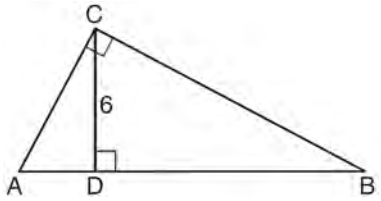


754 In the diagram of $\triangle BCD$ shown below, $\overline{BA}$ is drawn from vertex B to point A on $\overline{DC}$, such that $\overline{BC} \cong \overline{BA}$.

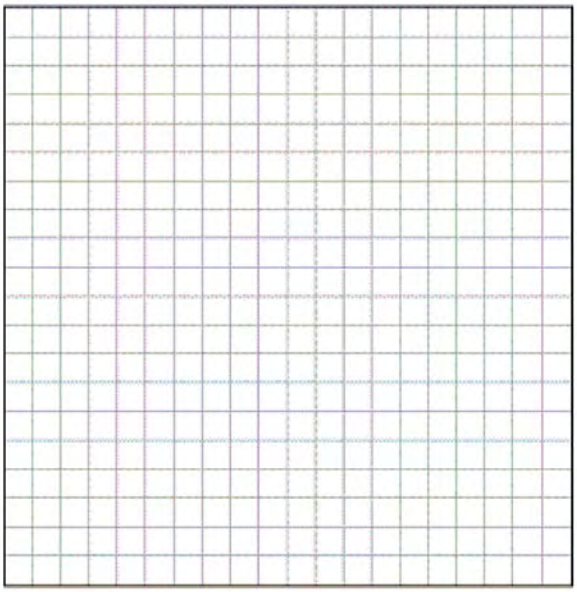


In $\triangle DAB$, $m\angle D = x$, $m\angle DAB = 5x - 30$, and $m\angle DBA = 3x - 60$. In $\triangle ABC$, $AB = 6y - 8$ and $BC = 4y - 2$. [Only algebraic solutions can receive full credit.] Find $m\angle D$. Find $m\angle BAC$. Find the length of $\overline{BC}$. Find the length of $\overline{DC}$.

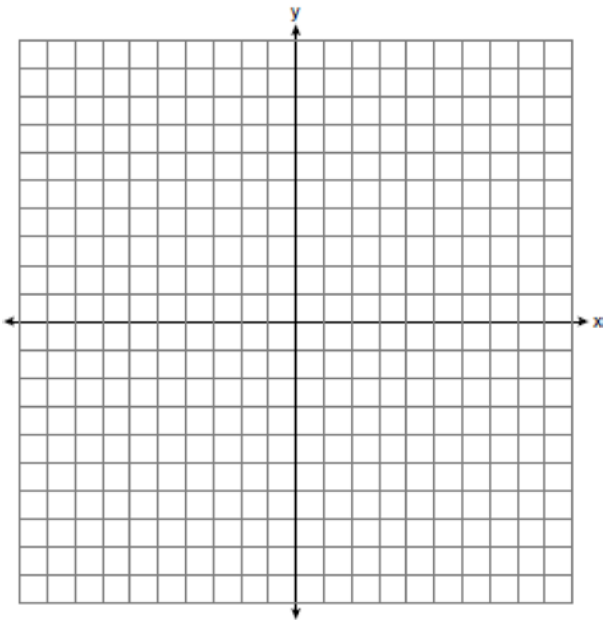
755 In right triangle ABC below, $\overline{CD}$ is the altitude to hypotenuse $\overline{AB}$. If $CD = 6$ and the ratio of AD to AB is 1:5, determine and state the length of $\overline{BD}$. [Only an algebraic solution can receive full credit.]



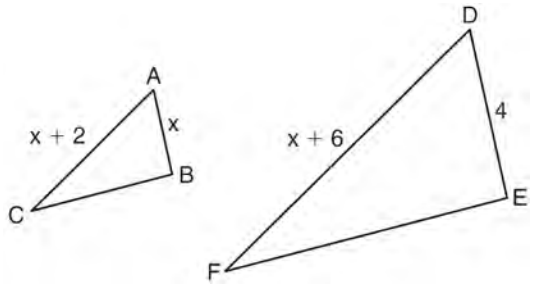
756 Triangle DEG has the coordinates $D(1,1)$, $E(5,1)$, and $G(5,4)$. Triangle DEG is rotated 90° about the origin to form $\triangle D'E'G'$. On the grid below, graph and label $\triangle DEG$ and $\triangle D'E'G'$. State the coordinates of the vertices D', E', and G'. Justify that this transformation preserves distance.



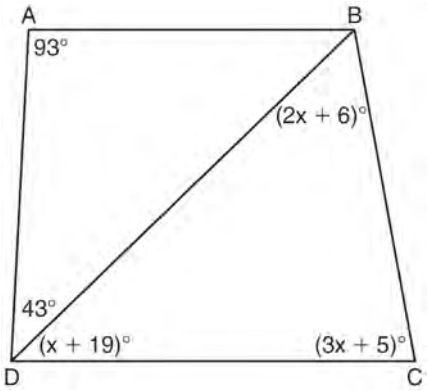
757 On the set of axes below, graph and label circle A whose equation is $(x+4)^2+(y-2)^2=16$ and circle B whose equation is $x^2+y^2=9$. Determine, in simplest radical form, the length of the line segment with endpoints at the centers of circles A and B.



758 In the diagram below, $\triangle ABC \sim \triangle DEF$, $DE = 4$, $AB = x$, $AC = x+2$, and $DF = x+6$. Determine the length of $\overline{AB}$. [Only an algebraic solution can receive full credit.]

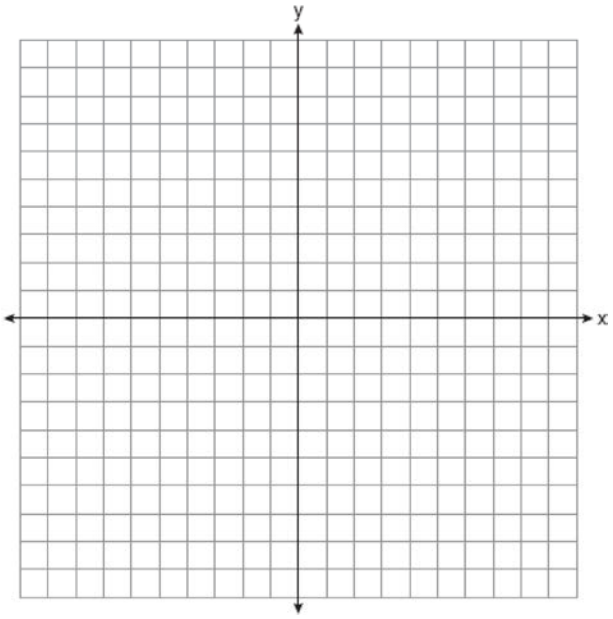


759 In the diagram below of quadrilateral $ABCD$ with diagonal $\overline{BD}$, $m\angle A = 93$, $m\angle ADB = 43$, $m\angle C = 3x+5$, $m\angle BDC = x+19$, and $m\angle DBC = 2x+6$. Determine if $\overline{AB}$ is parallel to $\overline{DC}$. Explain your reasoning.

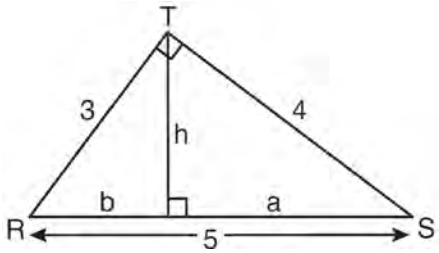


760 Point P is 5 units from line j. Sketch the locus of points that are 3 units from line j and also sketch the locus of points that are 8 units from P. Label with an **X** all points that satisfy *both* conditions.

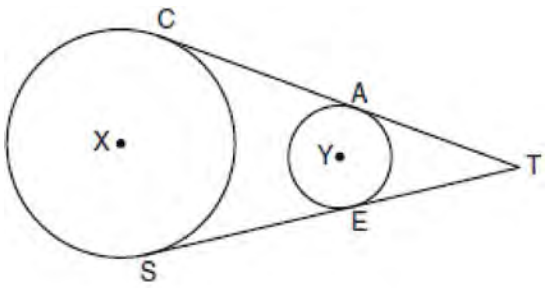
761 The vertices of $\triangle RST$ are $R(-6,5)$, $S(-7,-2)$, and $T(1,4)$. The image of $\triangle RST$ after the composition $T_{-2,3} \circ r_{y=x}$ is $\triangle R''S''T''$. State the coordinates of $\triangle R''S''T''$. [The use of the set of axes below is optional.]



762 In the diagram below, $\triangle RST$ is a $3-4-5$ right triangle. The altitude, h, to the hypotenuse has been drawn. Determine the length of h.



763 In the diagram below, circles X and Y have two tangents drawn to them from external point T. The points of tangency are C, A, S, and E. The ratio of TA to AC is $1:3$. If $TS = 24$, find the length of $\overline{SE}$.

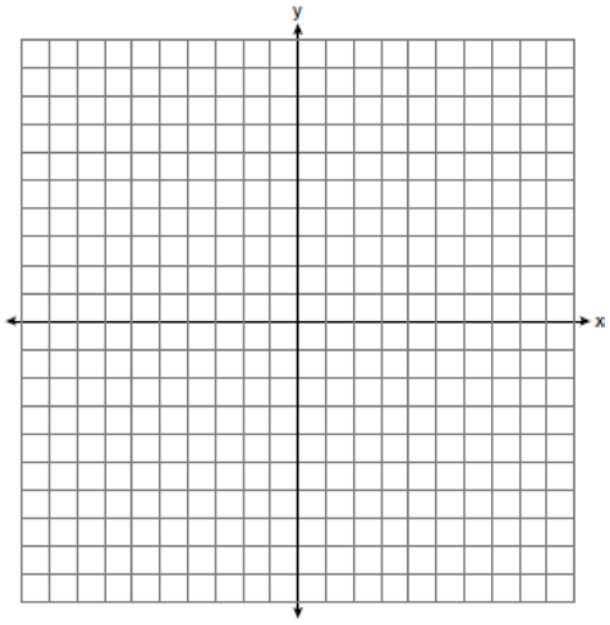


(Not drawn to scale)

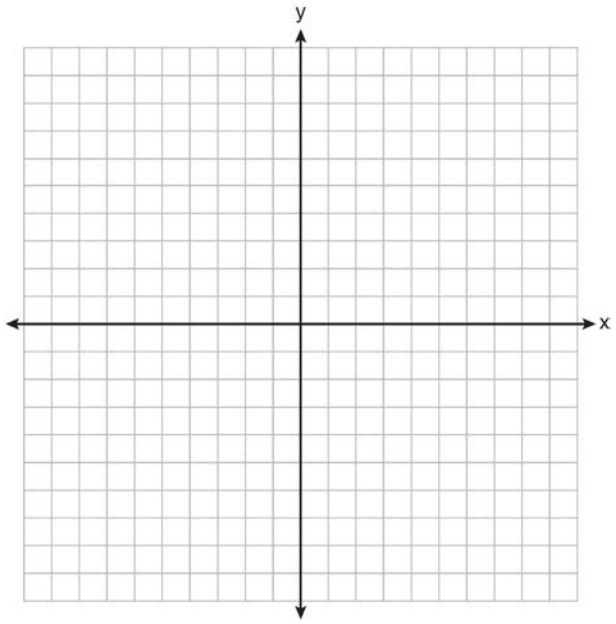
764 On the set of axes below, solve the following system of equations graphically and state the coordinates of *all* points in the solution.

$$(x+3)^2 + (y-2)^2 = 25$$

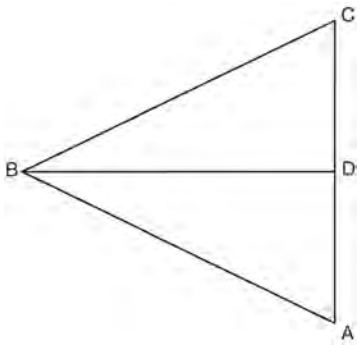
$$2y + 4 = -x$$



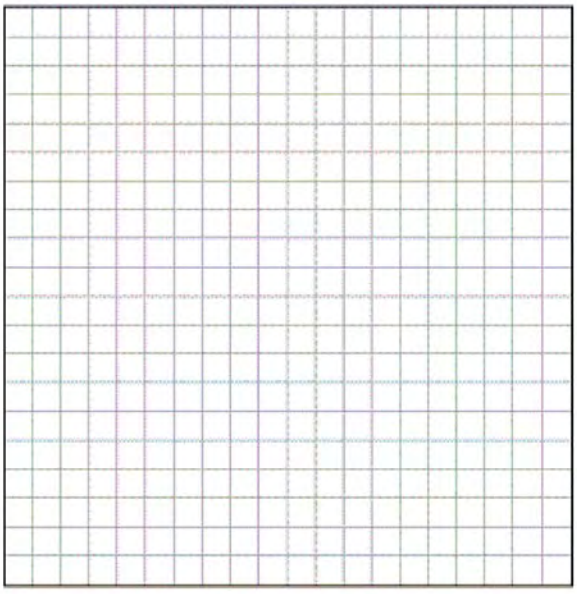
765 Triangle HKL has vertices $H(-7,2)$, $K(3,-4)$, and $L(5,4)$. The midpoint of $\overline{HL}$ is M and the midpoint of $\overline{LK}$ is N. Determine and state the coordinates of points M and N. Justify the statement: $\overline{MN}$ is parallel to $\overline{HK}$. [The use of the set of axes below is optional.]



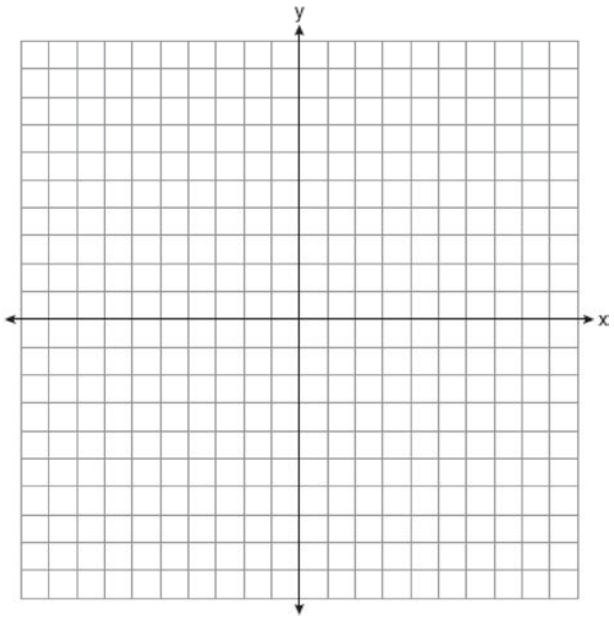
766 Given: $\triangle ABC$, $\overline{BD}$ bisects $\angle ABC$, $\overline{BD} \perp \overline{AC}$
Prove: $\overline{AB} \cong \overline{CB}$



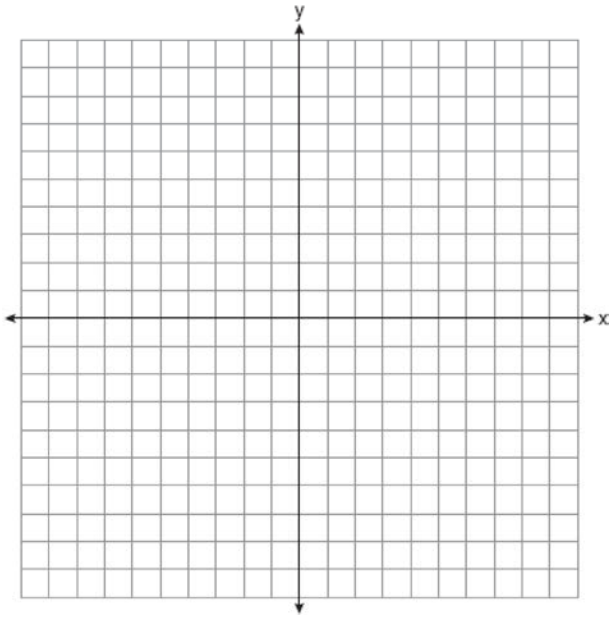
767 Triangle ABC has coordinates $A(-6,2)$, $B(-3,6)$, and $C(5,0)$. Find the perimeter of the triangle. Express your answer in simplest radical form. [The use of the grid below is optional.]



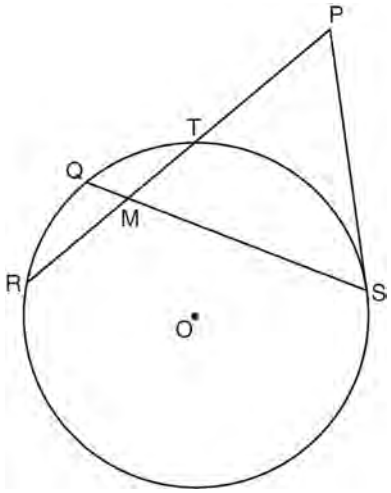
768 Quadrilateral *MATH* has coordinates $M(-6,-3)$, $A(-1,-3)$, $T(-2,-1)$, and $H(-4,-1)$. The image of quadrilateral *MATH* after the composition $r_{x\text{-axis}} \circ T_{7,5}$ is quadrilateral $M''A''T''H''$. State and label the coordinates of $M''A''T''H''$. [The use of the set of axes below is optional.]



769 The coordinates of the vertices of parallelogram *SWAN* are $S(2,-2)$, $W(-2,-4)$, $A(-4,6)$, and $N(0,8)$. State and label the coordinates of parallelogram $S''W''A''N''$, the image of *SWAN* after the transformation $T_{4,-2} \circ D\frac{1}{2}$. [The use of the set of axes below is optional.]

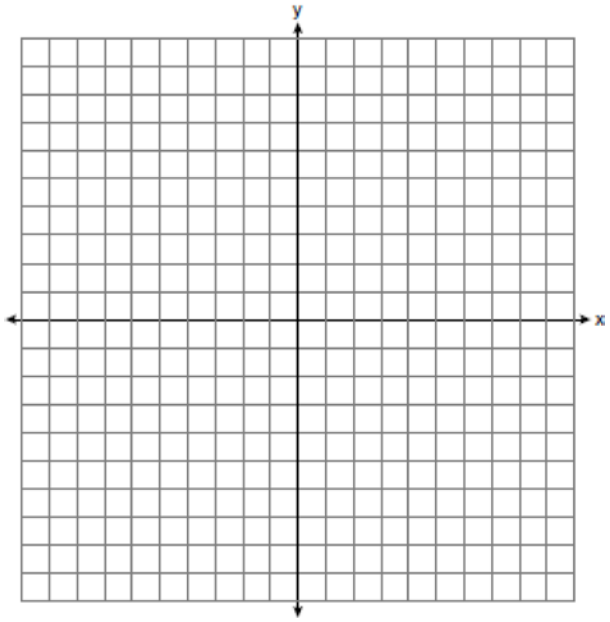


770 In the diagram below of circle O, chords $\overline{RT}$ and $\overline{QS}$ intersect at M. Secant $\overline{PTR}$ and tangent $\overline{PS}$ are drawn to circle O. The length of $\overline{RM}$ is two more than the length of $\overline{TM}$, $QM = 2$, $SM = 12$, and $PT = 8$.



Find the length of $\overline{RT}$. Find the length of $\overline{PS}$.

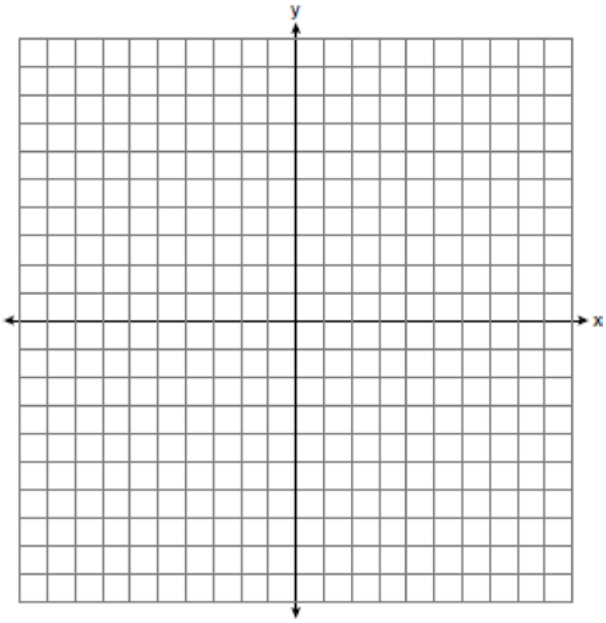
771 Triangle ABC has vertices $A(5,1)$, $B(1,4)$ and $C(1,1)$. State and label the coordinates of the vertices of $\triangle A''B''C''$, the image of $\triangle ABC$, following the composite transformation $T_{1,-1} \circ D_2$. [The use of the set of axes below is optional.]



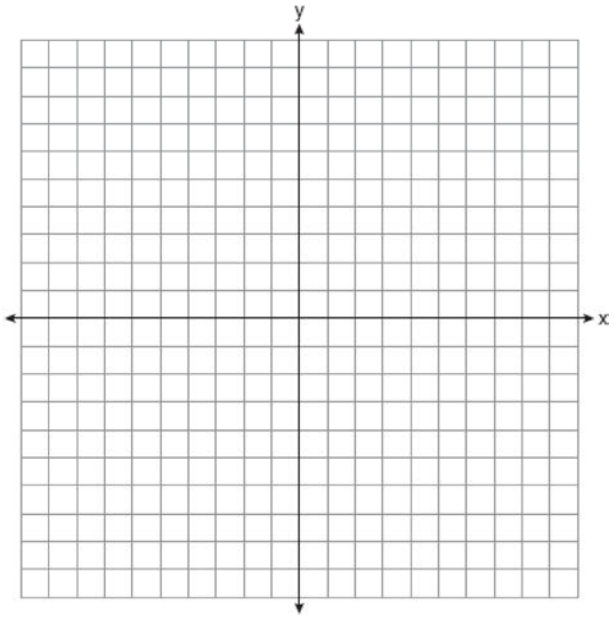
772 Solve the following system of equations graphically. State the coordinates of all points in the solution.

$$y + 4x = x^2 + 5$$

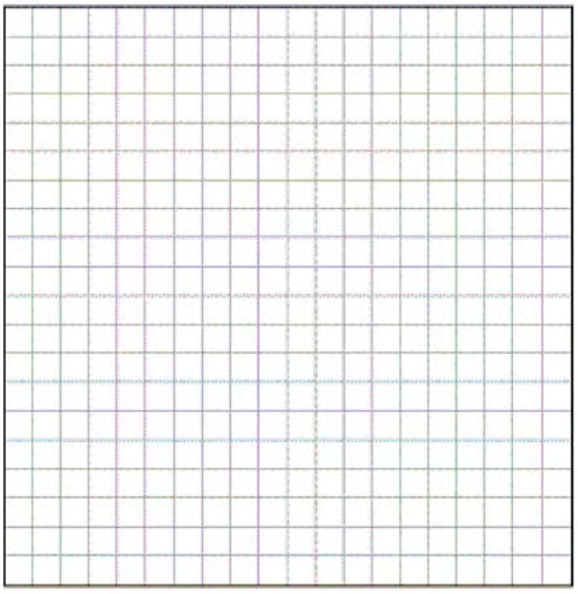
$$x + y = 5$$



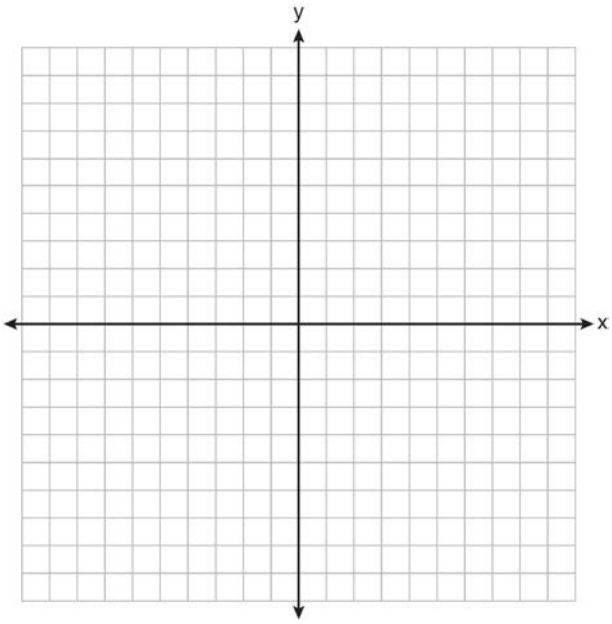
773 Quadrilateral *HYPE* has vertices $H(2,3)$, $Y(1,7)$, $P(-2,7)$, and $E(-2,4)$. State and label the coordinates of the vertices of *H"Y"P"E"* after the composition of transformations $r_{x-axis} \circ T_{5,-3}$. [The use of the set of axes below is optional.]



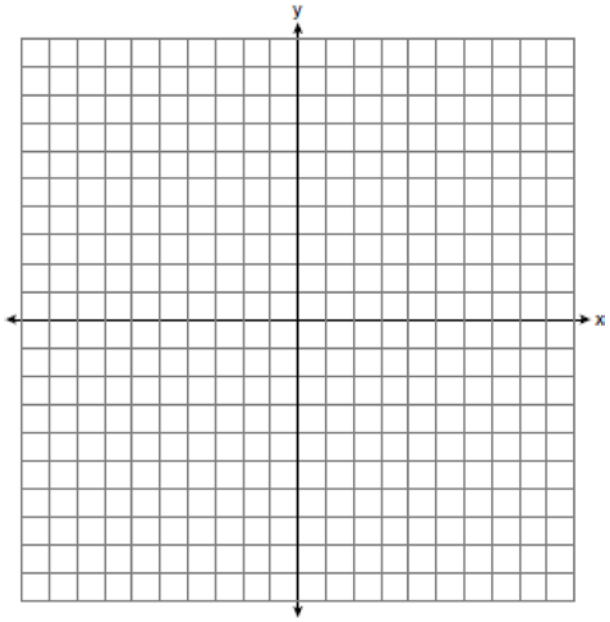
774 The coordinates of the vertices of $\triangle ABC$ $A(1,3)$, $B(-2,2)$ and $C(0,-2)$. On the grid below, graph and label $\triangle A''B''C''$, the result of the composite transformation $D_2 \circ T_{3,-2}$. State the coordinates of A'', B'', and C''.



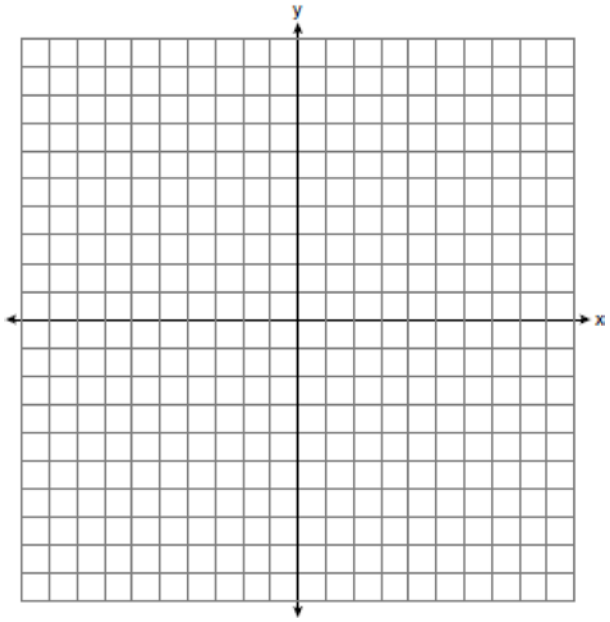
775 The coordinates of the vertices of parallelogram $ABCD$ are $A(-2,2)$, $B(3,5)$, $C(4,2)$, and $D(-1,-1)$. State the coordinates of the vertices of parallelogram $A''B''C''D''$ that result from the transformation $r_{y-\text{axis}} \circ T_{2,-3}$. [The use of the set of axes below is optional.]



776 On the set of coordinate axes below, graph the locus of points that are equidistant from the lines $y = 6$ and $y = 2$ and also graph the locus of points that are 3 units from the y-axis. State the coordinates of *all* points that satisfy *both* conditions.

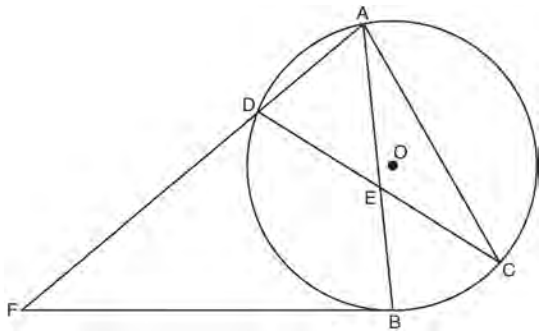


777 On the set of axes below, graph two horizontal lines whose y-intercepts are $(0,-2)$ and $(0,6)$, respectively. Graph the locus of points equidistant from these horizontal lines. Graph the locus of points 3 units from the y-axis. State the coordinates of the points that satisfy both loci.



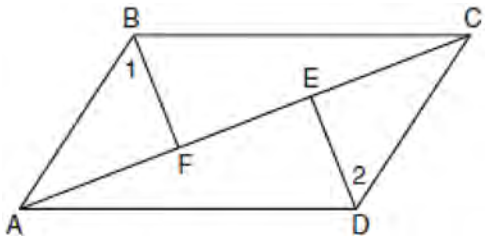
Geometry 6 Point Regents Exam Questions: Due to ExamView limitations, the following problems can not be numbered correctly. Precede each number with a 7

78 Chords $\overline{AB}$ and $\overline{CD}$ intersect at E in circle O, as shown in the diagram below. Secant $\overline{FDA}$ and tangent $\overline{FB}$ are drawn to circle O from external point F and chord $\overline{AC}$ is drawn. The $m\overset{\frown}{DA} = 56$, $m\overset{\frown}{DB} = 112$, and the ratio of $m\overset{\frown}{AC} : m\overset{\frown}{CB} = 3:1$.

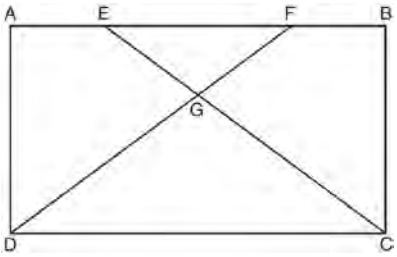


Determine $m\angle CEB$. Determine $m\angle F$. Determine $m\angle DAC$.

79 Given: Quadrilateral $ABCD$, diagonal $\overline{AFEC}$, $\overline{AE} \cong \overline{FC}$, $\overline{BF} \perp \overline{AC}$, $\overline{DE} \perp \overline{AC}$, $\angle 1 \cong \angle 2$
Prove: $ABCD$ is a parallelogram.



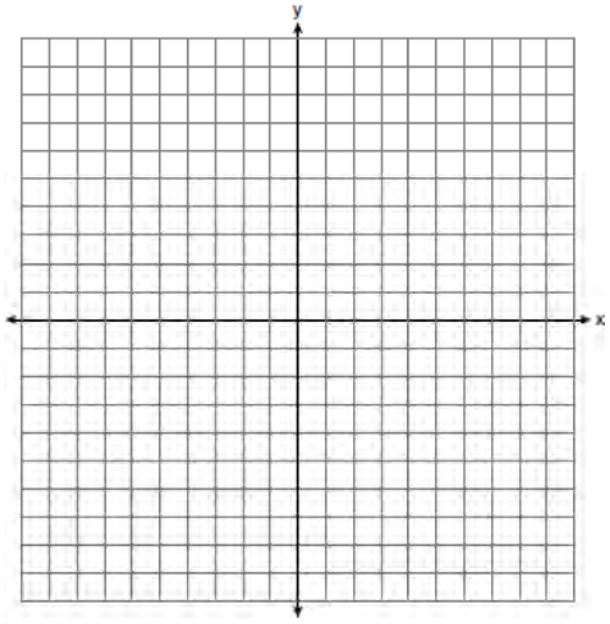
80 The diagram below shows rectangle $ABCD$ with points E and F on side $\overline{AB}$. Segments CE and DF intersect at G, and $\angle ADG \cong \angle BCG$. Prove: $\overline{AE} \cong \overline{BF}$



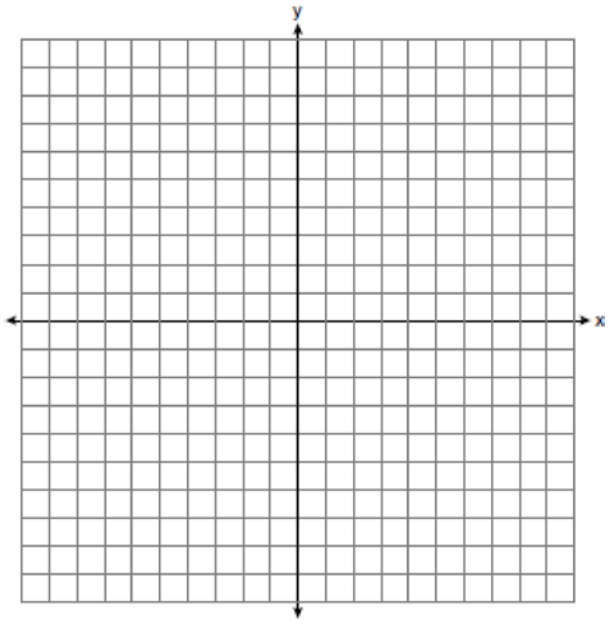
81 On the set of axes below, solve the system of equations graphically and state the coordinates of all points in the solution.

$$y = (x-2)^2 - 3$$

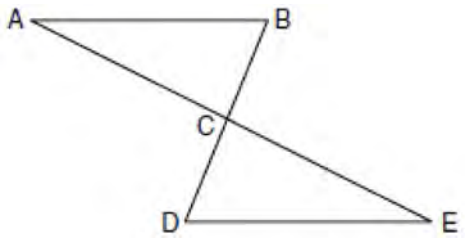
$$2y + 16 = 4x$$



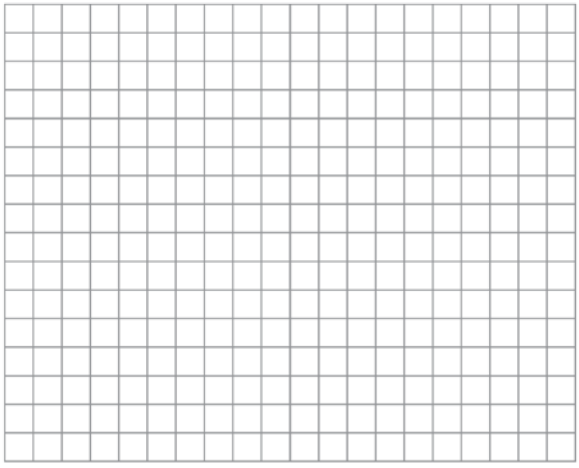
82 On the set of axes below, graph the locus of points 5 units from the point $(3,-2)$. On the same set of axes, graph the locus of points equidistant from the points $(0,-6)$ and $(2,-4)$. State the coordinates of all points that satisfy *both* conditions.



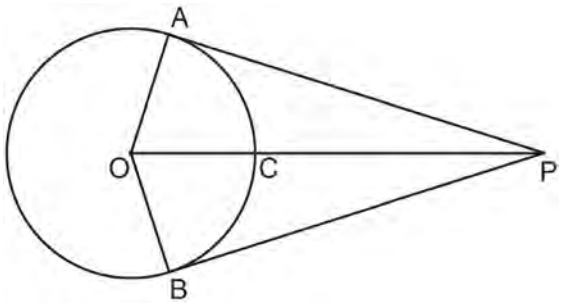
83 Given: $\triangle ABC$ and $\triangle EDC$, C is the midpoint of $\overline{BD}$ and $\overline{AE}$
Prove: $\overline{AB} \parallel \overline{DE}$



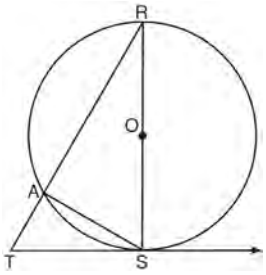
84 Given: Quadrilateral $ABCD$ has vertices $A(-5,6)$, $B(6,6)$, $C(8,-3)$, and $D(-3,-3)$.
Prove: Quadrilateral $ABCD$ is a parallelogram but is neither a rhombus nor a rectangle. [The use of the grid below is optional.]



85 In the diagram below, $\overline{PA}$ and $\overline{PB}$ are tangent to circle O, $\overline{OA}$ and $\overline{OB}$ are radii, and $\overline{OP}$ intersects the circle at C. Prove: $\angle AOP \cong \angle BOP$



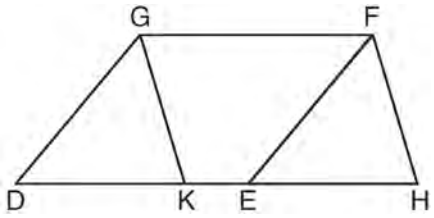
86 In the diagram of circle O below, diameter $\overline{RS}$, chord $\overline{AS}$, tangent $\overrightarrow{TS}$, and secant $\overline{TAR}$ are drawn.



Complete the following proof to show $(RS)^2 = RA \cdot RT$

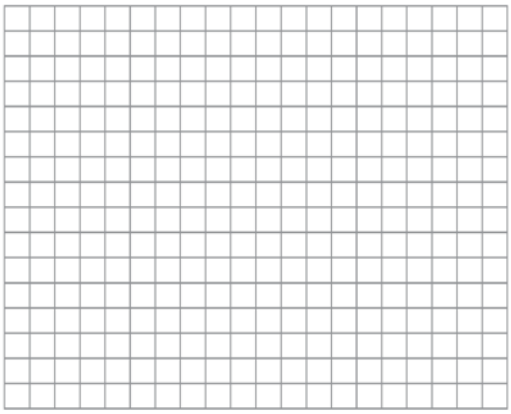
Statements	Reasons
1. circle O, diameter $\overline{RS}$, chord $\overline{AS}$, tangent $\overrightarrow{TS}$, and secant $\overline{TAR}$	1. Given
2. $\overline{RS} \perp \overrightarrow{TS}$	2. _____
3. $\angle RST$ is a right angle	3. $\perp$ lines form right angles
4. $\angle RAS$ is a right angle	4. _____
5. $\angle RST \cong \angle RAS$	5. _____
6. $\angle R \cong \angle R$	6. Reflexive property
7. $\triangle RST \sim \triangle RAS$	7. _____
8. $\frac{RS}{RA} = \frac{RT}{RS}$	8. _____
9. $(RS)^2 = RA \cdot RT$	9. _____

87 Given: Parallelogram $DEFG$, K and H are points on $\overrightarrow{DE}$ such that $\angle DGK \cong \angle EFH$ and $\overline{GK}$ and $\overline{FH}$ are drawn.

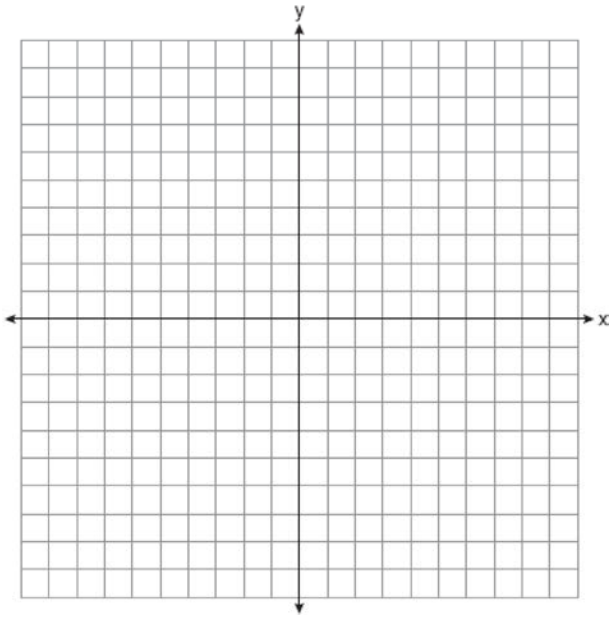


Prove: $\overline{DK} \cong \overline{EH}$

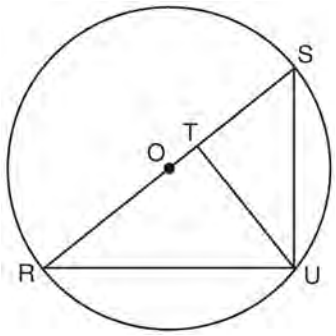
88 Given: $\triangle ABC$ with vertices $A(-6,-2)$, $B(2,8)$, and $C(6,-2)$. $\overline{AB}$ has midpoint D, $\overline{BC}$ has midpoint E, and $\overline{AC}$ has midpoint F.
Prove: $ADEF$ is a parallelogram
$ADEF$ is *not* a rhombus
[The use of the grid is optional.]



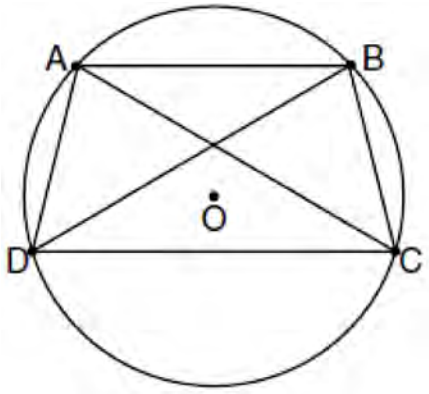
89 The vertices of quadrilateral *JKLM* have coordinates $J(-3,1)$, $K(1,-5)$, $L(7,-2)$, and $M(3,4)$. Prove that *JKLM* is a parallelogram. Prove that *JKLM* is *not* a rhombus. [The use of the set of axes below is optional.]



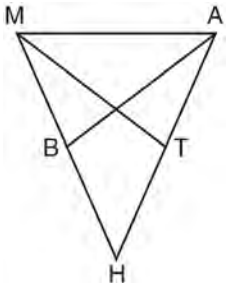
90 In the diagram below, right triangle *RSU* is inscribed in circle *O*, and $\overline{UT}$ is the altitude drawn to hypotenuse $\overline{RS}$. The length of $\overline{RT}$ is 16 more than the length of $\overline{TS}$ and $TU = 15$. Find the length of $\overline{TS}$. Find, in simplest radical form, the length of $\overline{RU}$.



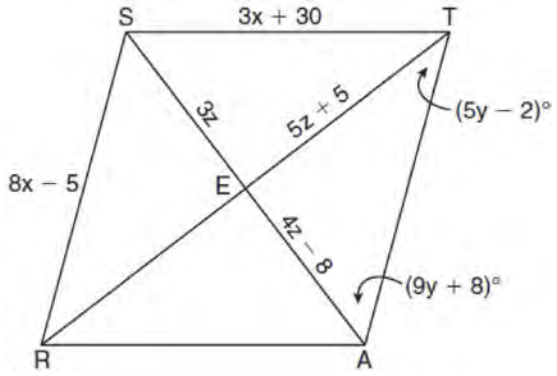
91 In the diagram below, quadrilateral *ABCD* is inscribed in circle *O*, $\overline{AB} \parallel \overline{DC}$, and diagonals $\overline{AC}$ and $\overline{BD}$ are drawn. Prove that $\triangle ACD \cong \triangle BDC$.



92 In the diagram of $\triangle MAH$ below, $\overline{MH} \cong \overline{AH}$ and medians $\overline{AB}$ and $\overline{MT}$ are drawn.
Prove: $\angle MBA \cong \angle ATM$



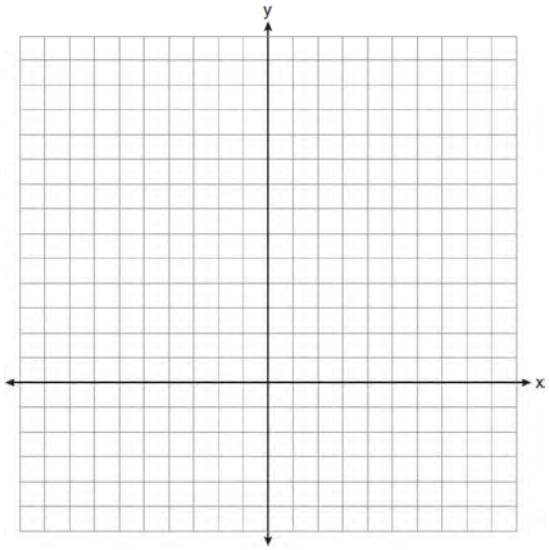
93 In the diagram below, quadrilateral *STAR* is a rhombus with diagonals $\overline{SA}$ and $\overline{TR}$ intersecting at *E*. $ST = 3x + 30$, $SR = 8x - 5$, $SE = 3z$, $TE = 5z + 5$, $AE = 4z - 8$, $m\angle RTA = 5y - 2$, and $m\angle TAS = 9y + 8$. Find *SR*, *RT*, and $m\angle TAS$.



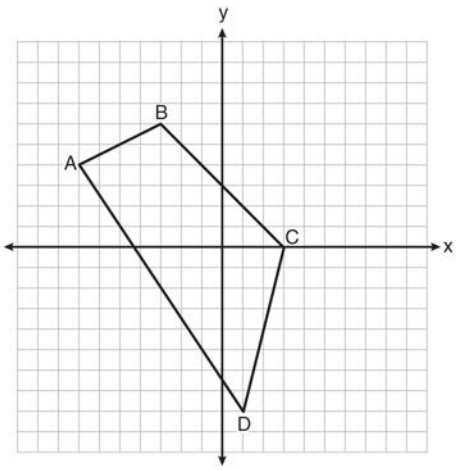
94 On the set of axes below, solve the following system of equations graphically for all values of *x* and *y*.

$$y = (x - 2)^2 + 4$$

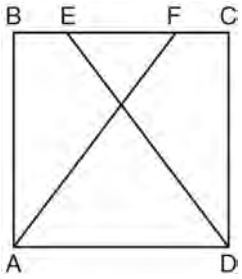
$$4x + 2y = 14$$



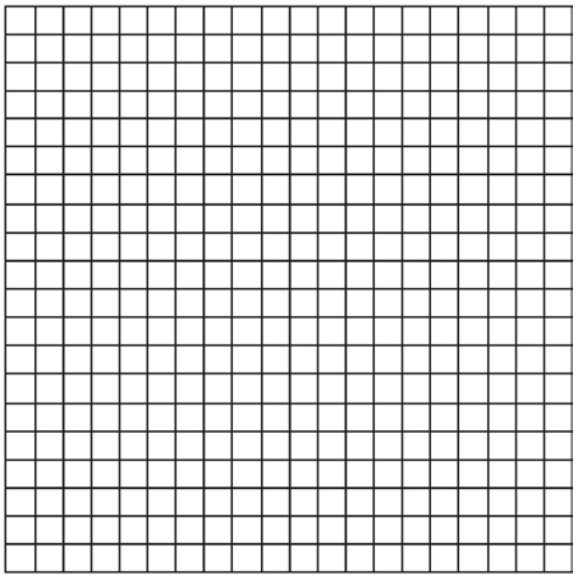
95 Quadrilateral *ABCD* with vertices $A(-7,4)$, $B(-3,6)$, $C(3,0)$, and $D(1,-8)$ is graphed on the set of axes below. Quadrilateral *MNPQ* is formed by joining *M*, *N*, *P*, and *Q*, the midpoints of $\overline{AB}$, $\overline{BC}$, $\overline{CD}$, and $\overline{AD}$, respectively. Prove that quadrilateral *MNPQ* is a parallelogram. Prove that quadrilateral *MNPQ* is *not* a rhombus.



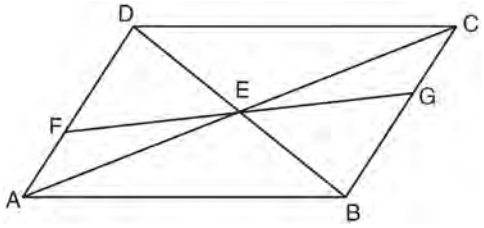
96 The diagram below shows square *ABCD* where *E* and *F* are points on $\overline{BC}$ such that $\overline{BE} \cong \overline{FC}$, and segments *AF* and *DE* are drawn. Prove that $\overline{AF} \cong \overline{DE}$.



97 Quadrilateral *MATH* has coordinates $M(1,1)$, $A(-2,5)$, $T(3,5)$, and $H(6,1)$. Prove that quadrilateral *MATH* is a rhombus and prove that it is *not* a square. [The use of the grid is optional.]



98 In the diagram below of quadrilateral *ABCD*, $\overline{AD} \cong \overline{BC}$ and $\angle DAE \cong \angle BCE$. Line segments *AC*, *DB*, and *FG* intersect at *E*. Prove: $\triangle AEF \cong \triangle CEG$



Geometry Multiple Choice Regents Exam Questions
Answer Section

1 ANS: 2 PTS: 2 REF: 061202ge STA: G.G.24
TOP: Negations

2 ANS: 1

$m = \frac{3}{2} \quad y = mx + b$

$2 = \frac{3}{2}(1) + b$

$\frac{1}{2} = b$

PTS: 2 REF: 081217ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

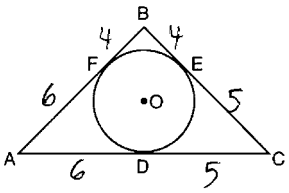
3 ANS: 1 PTS: 2 REF: 011213ge STA: G.G.24
TOP: Negations

4 ANS: 3

$\frac{3}{8+3+4} \times 180 = 36$

PTS: 2 REF: 011210ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

5 ANS: 3



PTS: 2 REF: 011101ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two tangents

6 ANS: 4 PTS: 2 REF: 011208ge STA: G.G.53
TOP: Segments Intercepted by Circle KEY: two tangents

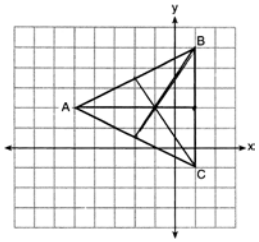
7 ANS: 4
$m\angle A = 80$

PTS: 2 REF: 011115ge STA: G.G.34 TOP: Angle Side Relationship

8 ANS: 4 PTS: 2 REF: 061203ge STA: G.G.9
TOP: Planes

9 ANS: 2 PTS: 2 REF: 011215ge STA: G.G.12
TOP: Volume

10 ANS: 1



PTS: 2 REF: 011516ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter

11 ANS: 2

$$V = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi \cdot \left(\frac{15}{2}\right)^3 \approx 1767.1$$

PTS: 2 REF: 061207ge STA: G.G.16 TOP: Volume and Surface Area

12 ANS: 3

$-5 + 3 = -2 \qquad 2 + -4 = -2$

PTS: 2 REF: 011107ge STA: G.G.54 TOP: Translations

13 ANS: 4 PTS: 2 REF: 081224ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter

14 ANS: 3

$$\frac{5}{7} = \frac{10}{x}$$

$5x = 70$

$x = 14$

PTS: 2 REF: 081103ge STA: G.G.46 TOP: Side Splitter Theorem

15 ANS: 4 PTS: 2 REF: 011222ge STA: G.G.34
TOP: Angle Side Relationship

16 ANS: 1

$$1 = \frac{-4 + x}{2}. \qquad 5 = \frac{3 + y}{2}.$$

$-4 + x = 2 \qquad 3 + y = 10$

$x = 6 \qquad y = 7$

PTS: 2 REF: 081115ge STA: G.G.66 TOP: Midpoint

17 ANS: 1 PTS: 2 REF: 081524ge STA: G.G.34
TOP: Angle Side Relationship

18 ANS: 1

The length of the midsegment of a trapezoid is the average of the lengths of its bases. $\frac{x+3+5x-9}{2} = 2x+2.$

$$6x-6 = 4x+4$$
$$2x = 10$$
$$x = 5$$

PTS: 2 REF: 081221ge STA: G.G.40 TOP: Trapezoids

19 ANS: 1

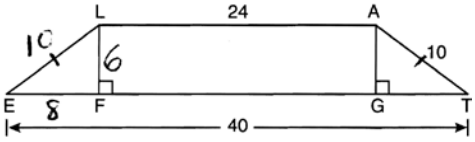
$3x+5+4x-15+2x+10 = 180.$ $\text{m}\angle D = 3(20)+5 = 65.$ $\text{m}\angle E = 4(20)-15 = 65.$

$$9x = 180$$
$$x = 20$$

PTS: 2 REF: 061119ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

20 ANS: 1

$\frac{40-24}{2} = 8.$ $\sqrt{10^2-8^2} = 6.$



PTS: 2 REF: 061204ge STA: G.G.40 TOP: Trapezoids

21 ANS: 2

$3x+x+20+x+20 = 180$

$$5x = 40$$
$$x = 28$$

PTS: 2 REF: 081222ge STA: G.G.31 TOP: Isosceles Triangle Theorem

22 ANS: 3 PTS: 2 REF: 061220ge STA: G.G.74
TOP: Graphing Circles

23 ANS: 2 PTS: 2 REF: 061509ge STA: G.G.55
TOP: Properties of Transformations

24 ANS: 2 PTS: 2 REF: 061121ge STA: G.G.22
TOP: Locus

25 ANS: 2 PTS: 2 REF: 011211ge STA: G.G.55
TOP: Properties of Transformations

26 ANS: 3 PTS: 2 REF: 061228ge STA: G.G.39
TOP: Special Parallelograms

27 ANS: 4

$\sqrt{6^2-2^2} = \sqrt{32} = \sqrt{16}\sqrt{2} = 4\sqrt{2}$

PTS: 2 REF: 081124ge STA: G.G.49 TOP: Chords

28 ANS: 1 PTS: 2 REF: 011220ge STA: G.G.72
TOP: Equations of Circles

29 ANS: 4

$4(x+4) = 8^2$

$4x + 16 = 64$

$4x = 48$

$x = 12$

PTS: 2 REF: 061117ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: tangent and secant

30 ANS: 4

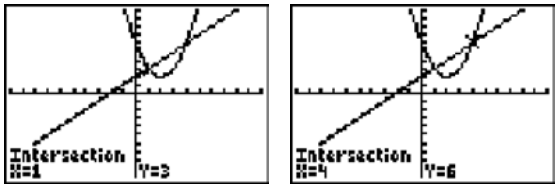
$x \cdot 4x = 6^2$. $PQ = 4x + x = 5x = 5(3) = 15$

$4x^2 = 36$

$x = 3$

PTS: 2 REF: 011227ge STA: G.G.47 TOP: Similarity
KEY: altitude

31 ANS: 3



PTS: 2 REF: 081118ge STA: G.G.70 TOP: Quadratic-Linear Systems

32 ANS: 4 PTS: 2 REF: 081206ge STA: G.G.30
TOP: Interior and Exterior Angles of Triangles

33 ANS: 3 PTS: 2 REF: 061224ge STA: G.G.45
TOP: Similarity KEY: basic

34 ANS: 4

$d = \sqrt{(-5-3)^2 + (4-(-6))^2} = \sqrt{64+100} = \sqrt{164} = \sqrt{4}\sqrt{41} = 2\sqrt{41}$

PTS: 2 REF: 011121ge STA: G.G.67 TOP: Distance
KEY: general

35 ANS: 2

$m = \frac{-A}{B} = \frac{-20}{-2} = 10.$ $m_{\perp} = -\frac{1}{10}$

PTS: 2 REF: 061219ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

36 ANS: 3 PTS: 2 REF: 081123ge STA: G.G.12
TOP: Volume

37 ANS: 4 PTS: 2 REF: 011216ge STA: G.G.29
TOP: Triangle Congruency

38 ANS: 2 PTS: 2 REF: 081527ge STA: G.G.33
TOP: Triangle Inequality Theorem

39 ANS: 4 PTS: 2 REF: 061124ge STA: G.G.31
TOP: Isosceles Triangle Theorem

40 ANS: 3

$y = mx + b$

$-1 = 2(2) + b$

$-5 = b$

PTS: 2 REF: 011224ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

41 ANS: 3 PTS: 2 REF: 011104ge STA: G.G.38
TOP: Parallelograms

42 ANS: 3 PTS: 2 REF: 061522ge STA: G.G.1
TOP: Planes

43 ANS: 3

The slope of $2y = x + 2$ is $\frac{1}{2}$, which is the opposite reciprocal of -2. $3 = -2(4) + b$

$11 = b$

PTS: 2 REF: 081228ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

44 ANS: 2 PTS: 2 REF: 061126ge STA: G.G.59
TOP: Properties of Transformations

45 ANS: 3

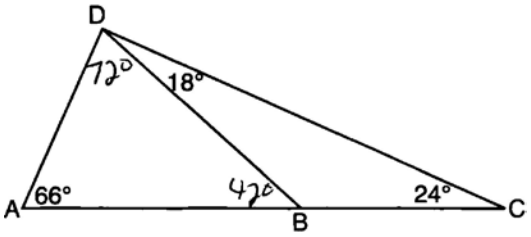
$4x + 14 + 8x + 10 = 180$

$12x = 156$

$x = 13$

PTS: 2 REF: 081213ge STA: G.G.35 TOP: Parallel Lines and Transversals

46 ANS: 1



PTS: 2 REF: 081219ge STA: G.G.34 TOP: Angle Side Relationship

47 ANS: 2 PTS: 2 REF: 081214ge STA: G.G.50
TOP: Tangents KEY: point of tangency

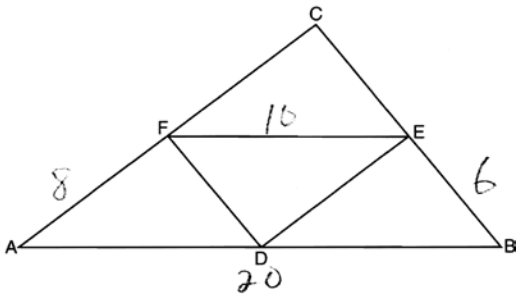
48 ANS: 1

The diagonals of a parallelogram intersect at their midpoints. $M_{\overline{AC}}\left(\frac{1+3}{2}, \frac{5+(-1)}{2}\right) = (2,2)$

PTS: 2 REF: 061209ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

49 ANS: 3 PTS: 2 REF: 081204ge STA: G.G.59
TOP: Properties of Transformations

50 ANS: 4

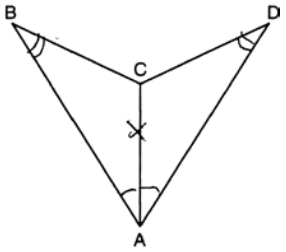


$20 + 8 + 10 + 6 = 44.$

PTS: 2 REF: 061211ge STA: G.G.42 TOP: Midsegments

51 ANS: 3 PTS: 2 REF: 011209ge STA: G.G.44
TOP: Similarity Proofs

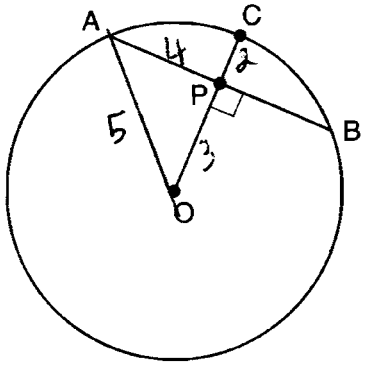
52 ANS: 4



PTS: 2 REF: 081114ge STA: G.G.28 TOP: Triangle Congruency

53 ANS: 1 PTS: 2 REF: 061104ge STA: G.G.43
TOP: Centroid

54 ANS: 3



PTS: 2 REF: 011112ge STA: G.G.49 TOP: Chords

55 ANS: 2 PTS: 2 REF: 081102ge STA: G.G.29
TOP: Triangle Congruency

56 ANS: 4 PTS: 2 REF: 081506ge STA: G.G.59
TOP: Properties of Transformations

57 ANS: 3 PTS: 2 REF: 081128ge STA: G.G.39
TOP: Special Parallelograms

58 ANS: 4 PTS: 2 REF: 061213ge STA: G.G.5
TOP: Planes

59 ANS: 1

$m = \left(\frac{8+0}{2}, \frac{2+6}{2}\right) = (4,4)$ $m = \frac{6-2}{0-8} = \frac{4}{-8} = -\frac{1}{2}$ $m_{\perp} = 2$ $y = mx + b$

$4 = 2(4) + b$

$-4 = b$

PTS: 2 REF: 081126ge STA: G.G.68 TOP: Perpendicular Bisector

60 ANS: 3

$x + 2x + 15 = 5x + 15$ $2(5) + 15 = 25$

$3x + 15 = 5x + 5$

$10 = 2x$

$5 = x$

PTS: 2 REF: 011127ge STA: G.G.32 TOP: Exterior Angle Theorem

61 ANS: 4 PTS: 2 REF: 011118ge STA: G.G.25
TOP: Compound Statements KEY: general

62 ANS: 4 PTS: 2 REF: 081110ge STA: G.G.71
TOP: Equations of Circles

63 ANS: 2 PTS: 2 REF: 081515ge STA: G.G.55
TOP: Properties of Transformations

64 ANS: 1 PTS: 2 REF: 011112ge STA: G.G.39
TOP: Special Parallelograms

65 ANS: 4

The slope of $3x + 5y = 4$ is $m = \frac{-A}{B} = \frac{-3}{5}$. $m_{\perp} = \frac{5}{3}$.

PTS: 2 REF: 061127ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

66 ANS: 2

$7x = 5x + 30$

$2x = 30$

$x = 15$

PTS: 2 REF: 061106ge STA: G.G.35 TOP: Parallel Lines and Transversals

67 ANS: 2 PTS: 2 REF: 061516ge STA: G.G.52
TOP: Chords and Secants

68 ANS: 2

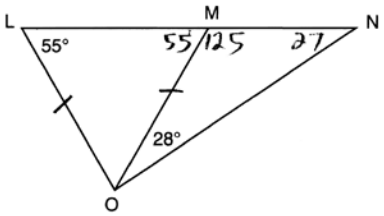
$\frac{50 + x}{2} = 34$

$50 + x = 68$

$x = 18$

PTS: 2 REF: 011214ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: inside circle

69 ANS: 1



PTS: 2 REF: 061211ge STA: G.G.31 TOP: Isosceles Triangle Theorem

70 ANS: 2 PTS: 2 REF: 081117ge STA: G.G.23
TOP: Locus

71 ANS: 2 PTS: 2 REF: 061208ge STA: G.G.19
TOP: Constructions

72 ANS: 3 PTS: 2 REF: 081218ge STA: G.G.1
TOP: Planes

73 ANS: 1 PTS: 2 REF: 061214ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter

74 ANS: 1

$7x + 4 = 2(2x + 5)$. $PM = 2(2) + 5 = 9$

$7x + 4 = 4x + 10$

$3x = 6$

$x = 2$

PTS: 2 REF: 011226ge STA: G.G.43 TOP: Centroid

75 ANS: 1 PTS: 2 REF: 081508ge STA: G.G.10
TOP: Solids

76 ANS: 1 PTS: 2 REF: 011526ge STA: G.G.10
TOP: Solids

77 ANS: 3 PTS: 2 REF: 011110ge STA: G.G.21
KEY: Centroid, Orthocenter, Incenter and Circumcenter

78 ANS: 3

$$180(n-2) = n\left(180 - \frac{180(n-2)}{n}\right)$$

$180n - 360 = 180n - 180n + 360$

$180n = 720$

$n = 4$

PTS: 2 REF: 081223ge STA: G.G.36 TOP: Interior and Exterior Angles of Polygons

79 ANS: 4

$\overline{AB}$ is a vertical line, so its perpendicular bisector is a horizontal line through the midpoint of $\overline{AB}$, which is $(0,3)$.

PTS: 2 REF: 011225ge STA: G.G.68 TOP: Perpendicular Bisector

80 ANS: 3

Diagonals of rectangles and trapezoids do not bisect opposite angles. m$\angle DAB = 90$ if *ABCD* is a square.

PTS: 2 REF: 061511ge STA: G.G.39 TOP: Special Parallelograms

81 ANS: 2 PTS: 2 REF: 061101ge STA: G.G.18
TOP: Constructions

82 ANS: 2

$$V = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi \cdot \left(\frac{6}{2}\right)^3 \approx 36\pi$$

PTS: 2 REF: 081215ge STA: G.G.16 TOP: Volume and Surface Area

83 ANS: 4
The centroid divides each median into segments whose lengths are in the ratio 2 : 1.

PTS: 2 REF: 081220ge STA: G.G.43 TOP: Centroid

84 ANS: 2 PTS: 2 REF: 011109ge STA: G.G.9
TOP: Planes

85 ANS: 2

$$M_x = \frac{7 + (-3)}{2} = 2. \quad M_Y = \frac{-1 + 3}{2} = 1.$$

PTS: 2 REF: 011106ge STA: G.G.66 TOP: Midpoint

86 ANS: 3 PTS: 2 REF: 061210ge STA: G.G.71
TOP: Equations of Circles

87 ANS: 4

$x + 6y = 12$ $\qquad 3(x - 2) = -y - 4$

$6y = -x + 12$ $\qquad -3(x - 2) = y + 4$

$y = -\frac{1}{6}x + 2$ $\qquad m = -3$

$m = -\frac{1}{6}$

PTS: 2 REF: 011119ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

88 ANS: 1 PTS: 2 REF: 011122ge STA: G.G.28
TOP: Triangle Congruency

89 ANS: 3 PTS: 2 REF: 081512ge STA: G.G.19
TOP: Constructions

90 ANS: 2 PTS: 2 REF: 081108ge STA: G.G.54
TOP: Reflections KEY: basic

91 ANS: 4 PTS: 2 REF: 081505ge STA: G.G.25
TOP: Compound Statements KEY: disjunction

92 ANS: 3 PTS: 2 REF: 081507ge STA: G.G.46
TOP: Side Splitter Theorem

93 ANS: 4

$m_{\perp} = -\frac{1}{3}$. $y = mx + b$

$6 = -\frac{1}{3}(-9) + b$

$6 = 3 + b$

$3 = b$

PTS: 2 REF: 061215ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

94 ANS: 1

$AB = CD$

$AB + BC = CD + BC$

$AC = BD$

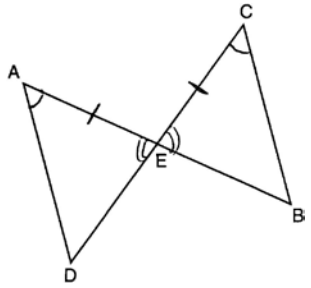
PTS: 2 REF: 081207ge STA: G.G.27 TOP: Triangle Proofs

95 ANS: 4 PTS: 2 REF: 081106ge STA: G.G.17
TOP: Constructions

96 ANS: 1 PTS: 2 REF: 011128ge STA: G.G.2
TOP: Planes

97 ANS: 1 PTS: 2 REF: 061113ge STA: G.G.63
TOP: Parallel and Perpendicular Lines

98 ANS: 1



PTS: 2 REF: 081210ge STA: G.G.28 TOP: Triangle Congruency

99 ANS: 4 PTS: 2 REF: 011108ge STA: G.G.27
TOP: Angle Proofs

100 ANS: 4

$y = mx + b$

$3 = \frac{3}{2}(-2) + b$

$3 = -3 + b$

$6 = b$

PTS: 2 REF: 011114ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

101 ANS: 1 PTS: 2 REF: 081113ge STA: G.G.54
TOP: Reflections KEY: basic

102 ANS: 4 PTS: 2 REF: 081216ge STA: G.G.45
TOP: Similarity KEY: basic
103 ANS: 1 PTS: 2 REF: 081517ge STA: G.G.41
TOP: Special Quadrilaterals
104 ANS: 3

$d = \sqrt{(1-9)^2 + (-4-2)^2} = \sqrt{64+36} = \sqrt{100} = 10$

PTS: 2 REF: 081107ge STA: G.G.67 TOP: Distance
KEY: general
105 ANS: 3

As originally administered, this question read, "Which fact is *not* sufficient to show that planes $\mathcal{R}$ and $\mathcal{S}$ are perpendicular?" The State Education Department stated that since a correct solution was not provided for Question 11, all students shall be awarded credit for this question.

PTS: 2 REF: 081211ge STA: G.G.5 TOP: Planes
106 ANS: 2 PTS: 2 REF: 011125ge STA: G.G.74
TOP: Graphing Circles
107 ANS: 4

$6^2 = x(x+5)$

$36 = x^2 + 5x$

$0 = x^2 + 5x - 36$

$0 = (x+9)(x-4)$

$x = 4$

PTS: 2 REF: 011123ge STA: G.G.47 TOP: Similarity
KEY: leg
108 ANS: 3 PTS: 2 REF: 011105ge STA: G.G.10
TOP: Solids
109 ANS: 1 PTS: 2 REF: 061108ge STA: G.G.9
TOP: Planes
110 ANS: 1

Parallel lines intercept congruent arcs.

PTS: 2 REF: 061105ge STA: G.G.52 TOP: Chords and Secants
111 ANS: 1

$d = \sqrt{(4-1)^2 + (7-11)^2} = \sqrt{9+16} = \sqrt{25} = 5$

PTS: 2 REF: 011205ge STA: G.G.67 TOP: Distance
KEY: general
112 ANS: 1 PTS: 2 REF: 011207ge STA: G.G.20
TOP: Constructions

113 ANS: 4

$\sqrt{25^2 - 7^2} = 24$

PTS: 2 REF: 081105ge STA: G.G.50 TOP: Tangents
KEY: point of tangency

114 ANS: 3 PTS: 2 REF: 061122ge STA: G.G.56
TOP: Identifying Transformations

115 ANS: 4

$-5 = \frac{-3 + x}{2}$. $2 = \frac{6 + y}{2}$

$-10 = -3 + x$ $4 = 6 + y$

$-7 = x$ $-2 = y$

PTS: 2 REF: 081203ge STA: G.G.66 TOP: Midpoint

116 ANS: 4
Parallel lines intercept congruent arcs.

PTS: 2 REF: 081201ge STA: G.G.52 TOP: Chords and Secants

117 ANS: 1

$10 - 4 < s < 10 + 4$

$6 < s < 14$

PTS: 2 REF: 011519ge STA: G.G.33 TOP: Triangle Inequality Theorem

118 ANS: 4 PTS: 2 REF: 011212ge STA: G.G.71
TOP: Equations of Circles

119 ANS: 4

$x^2 - 6x + 2x - 3 = 9x + 27$

$x^2 - 4x - 3 = 9x + 27$

$x^2 - 13x - 30 = 0$

$(x - 15)(x + 2) = 0$

$x = 15, -2$

PTS: 2 REF: 061225ge STA: G.G.32 TOP: Exterior Angle Theorem

120 ANS: 4 PTS: 2 REF: 081101ge STA: G.G.25
TOP: Compound Statements KEY: conjunction

121 ANS: 1 PTS: 2 REF: 081116ge STA: G.G.7
TOP: Planes

122 ANS: 4 PTS: 2 REF: 081501ge STA: G.G.29
TOP: Triangle Congruency

123 ANS: 4

$k: m = \frac{2}{3}$ $m: m = \frac{-A}{B} = \frac{-2}{3}$ $n: m = \frac{3}{2}$

PTS: 2 REF: 061518ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

124 ANS: 2 PTS: 2 REF: 061201ge STA: G.G.59
TOP: Properties of Transformations

125 ANS: 2

$6x + 42 = 18x - 12$

$54 = 12x$

$x = \frac{54}{12} = 4.5$

PTS: 2 REF: 011201ge STA: G.G.35 TOP: Parallel Lines and Transversals

126 ANS: 3

$d = \sqrt{(-1-4)^2 + (0-(-3))^2} = \sqrt{25+9} = \sqrt{34}$

PTS: 2 REF: 061217ge STA: G.G.67 TOP: Distance
KEY: general

127 ANS: 3

$\sqrt{5^2 + 12^2} = 13$

PTS: 2 REF: 061116ge STA: G.G.39 TOP: Special Parallelograms

128 ANS: 4 PTS: 2 REF: 061118ge STA: G.G.1
TOP: Planes

129 ANS: 4 PTS: 2 REF: 011124ge STA: G.G.51
TOP: Arcs Determined by Angles KEY: inscribed

130 ANS: 2

$5 - 3 = 2, 5 + 3 = 8$

PTS: 2 REF: 011228ge STA: G.G.33 TOP: Triangle Inequality Theorem

131 ANS: 3 PTS: 2 REF: 081104ge STA: G.G.55
TOP: Properties of Transformations

132 ANS: 2 PTS: 2 REF: 081205ge STA: G.G.17
TOP: Constructions

133 ANS: 2

$AC = BD$

$AC - BC = BD - BC$

$AB = CD$

PTS: 2 REF: 061206ge STA: G.G.27 TOP: Line Proofs

134 ANS: 1 PTS: 2 REF: 011218ge STA: G.G.3
TOP: Planes

135 ANS: 2 PTS: 2 REF: 011510ge STA: G.G.34
TOP: Angle Side Relationship
136 ANS: 2 PTS: 2 REF: 081226ge STA: G.G.69
TOP: Triangles in the Coordinate Plane
137 ANS: 2
$V = \pi r^2 h = \pi \cdot 6^2 \cdot 15 = 540\pi$

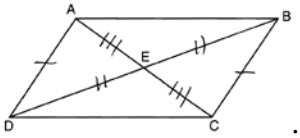
PTS: 2 REF: 011117ge STA: G.G.14 TOP: Volume and Lateral Area
138 ANS: 2 PTS: 2 REF: 061115ge STA: G.G.69
TOP: Triangles in the Coordinate Plane
139 ANS: 1
$x^2 = 7(16-7)$

$x^2 = 63$

$x = \sqrt{9}\sqrt{7}$

$x = 3\sqrt{7}$

PTS: 2 REF: 061128ge STA: G.G.47 TOP: Similarity
KEY: altitude
140 ANS: 2
$\frac{4x+10}{2} = 2x+5$

PTS: 2 REF: 011103ge STA: G.G.42 TOP: Midsegments
141 ANS: 3 PTS: 2 REF: 061508ge STA: G.G.32
TOP: Exterior Angle Theorem
142 ANS: 1 PTS: 2 REF: 081121ge STA: G.G.39
TOP: Special Parallelograms
143 ANS: 3 PTS: 2 REF: 011217ge STA: G.G.64
TOP: Parallel and Perpendicular Lines
144 ANS: 2 PTS: 2 REF: 011203ge STA: G.G.73
TOP: Equations of Circles
145 ANS: 3


. Opposite sides of a parallelogram are congruent and the diagonals of a parallelogram bisect each other.

PTS: 2 REF: 061222ge STA: G.G.28 TOP: Triangle Congruency
146 ANS: 2 PTS: 2 REF: 081120ge STA: G.G.8
TOP: Planes

147 ANS: 3

$\frac{7x}{4} = \frac{7}{x}$. $7(2) = 14$

$7x^2 = 28$

$x = 2$

PTS: 2 REF: 061120ge STA: G.G.45 TOP: Similarity
KEY: basic

148 ANS: 3 PTS: 2 REF: 061501ge STA: G.G.61
TOP: Analytical Representations of Transformations

149 ANS: 2 PTS: 2 REF: 061227ge STA: G.G.56
TOP: Identifying Transformations

150 ANS: 1 PTS: 2 REF: 011221ge STA: G.G.10
TOP: Solids

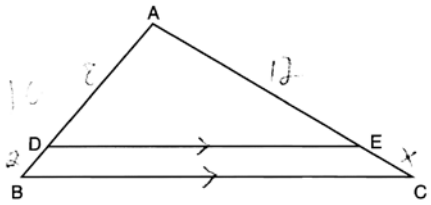
151 ANS: 1 PTS: 2 REF: 061125ge STA: G.G.39
TOP: Special Parallelograms

152 ANS: 3

The slope of $9x - 3y = 27$ is $m = \frac{-A}{B} = \frac{-9}{-3} = 3$, which is the opposite reciprocal of $-\frac{1}{3}$.

PTS: 2 REF: 081225ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

153 ANS: 3



$\frac{8}{2} = \frac{12}{x}$.

$8x = 24$

$x = 3$

PTS: 2 REF: 061216ge STA: G.G.46 TOP: Side Splitter Theorem

154 ANS: 3 PTS: 2 REF: 011503ge STA: G.G.55
TOP: Properties of Transformations

155 ANS: 3 PTS: 2 REF: 011524ge STA: G.G.58
TOP: Dilations

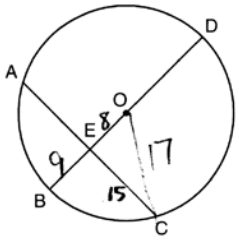
156 ANS: 4

$m = \frac{-A}{B} = \frac{-4}{6} = -\frac{2}{3}$

PTS: 2 REF: 011520ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

157 ANS: 3 PTS: 2 REF: 061218ge STA: G.G.36
TOP: Interior and Exterior Angles of Polygons

158 ANS: 2



$\sqrt{17^2 - 15^2} = 8.\ \ 17 - 8 = 9$

PTS: 2 REF: 061221ge STA: G.G.49 TOP: Chords

159 ANS: 4

$\frac{5}{2+3+5} \times 180 = 90$

PTS: 2 REF: 081119ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

160 ANS: 1 PTS: 2 REF: 011120ge STA: G.G.18
TOP: Constructions

161 ANS: 2

The slope of a line in standard form is $\frac{-A}{B}$, so the slope of this line is $\frac{-4}{3}$. A parallel line would also have a slope of $\frac{-4}{3}$. Since the answers are in standard form, use the point-slope formula. $y - 2 = -\frac{4}{3}(x + 5)$

$3y - 6 = -4x - 20$

$4x + 3y = -14$

PTS: 2 REF: 061123ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

162 ANS: 3 PTS: 2 REF: 011518ge STA: G.G.74
TOP: Graphing Circles

163 ANS: 3 PTS: 2 REF: 011202ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter

164 ANS: 2 PTS: 2 REF: 061107ge STA: G.G.32
TOP: Exterior Angle Theorem

165 ANS: 2

$(n-2)180 = (6-2)180 = 720.\ \ \frac{720}{6} = 120.$

PTS: 2 REF: 081125ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

166 ANS: 2 PTS: 2 REF: 011522ge STA: G.G.38
TOP: Parallelograms

167 ANS: 1 PTS: 2 REF: 061223ge STA: G.G.73
TOP: Equations of Circles

168 ANS: 2

$d = \sqrt{(-1-7)^2 + (9-4)^2} = \sqrt{64+25} = \sqrt{89}$

PTS: 2 REF: 061109ge STA: G.G.67 TOP: Distance
KEY: general

169 ANS: 2 PTS: 2 REF: 081212ge STA: G.G.72
TOP: Equations of Circles

170 ANS: 4

$m = \frac{-A}{B} = \frac{-3}{2}$. $y = mx + b$

$-1 = \left(\frac{-3}{2}\right)(2) + b$

$-1 = -3 + b$

$2 = b$

PTS: 2 REF: 061226ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

171 ANS: 3 PTS: 2 REF: 061111ge STA: G.G.38
TOP: Parallelograms

172 ANS: 3 PTS: 2 REF: 081227ge STA: G.G.42
TOP: Midsegments

173 ANS: 3

$(n-2)180 = (5-2)180 = 540$

PTS: 2 REF: 011223ge STA: G.G.36 TOP: Interior and Exterior Angles of Polygons

174 ANS: 3 PTS: 2 REF: 081208ge STA: G.G.27
TOP: Quadrilateral Proofs

175 ANS: 3

$(3,-2) \rightarrow (2,3) \rightarrow (8,12)$

PTS: 2 REF: 011126ge STA: G.G.54 TOP: Compositions of Transformations
KEY: basic

176 ANS: 3

$7x = 5x + 30$

$2x = 30$

$x = 15$

PTS: 2 REF: 081109ge STA: G.G.35 TOP: Parallel Lines and Transversals

177 ANS: 3 PTS: 2 REF: 081209ge STA: G.G.71
TOP: Equations of Circles

178 ANS: 1 PTS: 2 REF: 061110ge STA: G.G.72
TOP: Equations of Circles

179 ANS: 2

$m = \frac{-A}{B} = \frac{-4}{2} = -2$ $y = mx + b$

$2 = -2(2) + b$

$6 = b$

PTS: 2 REF: 081112ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

180 ANS: 3

$x^2 + 7^2 = (x+1)^2 \qquad x + 1 = 25$

$x^2 + 49 = x^2 + 2x + 1$

$48 = 2x$

$24 = x$

PTS: 2 REF: 081127ge STA: G.G.48 TOP: Pythagorean Theorem

181 ANS: 3 PTS: 2 REF: 011116ge STA: G.G.71
TOP: Equations of Circles

182 ANS: 1 PTS: 2 REF: 011102ge STA: G.G.55
TOP: Properties of Transformations

183 ANS: 2 PTS: 2 REF: 081202ge STA: G.G.55
TOP: Properties of Transformations

184 ANS: 2 PTS: 2 REF: 011509ge STA: G.G.17
TOP: Constructions

185 ANS: 3 PTS: 2 REF: 061102ge STA: G.G.29
TOP: Triangle Congruency

186 ANS: 3

$8^2 + 24^2 \neq 25^2$

PTS: 2 REF: 011111ge STA: G.G.48 TOP: Pythagorean Theorem

187 ANS: 4 PTS: 2 REF: 061503ge STA: G.G.10
TOP: Solids

188 ANS: 2

The diagonals of a rhombus are perpendicular. $180 - (90 + 12) = 78$

PTS: 2 REF: 011204ge STA: G.G.39 TOP: Special Parallelograms

189 ANS: 3 PTS: 2 REF: 081111ge STA: G.G.32
TOP: Exterior Angle Theorem

190 ANS: 4

$\sqrt{25^2 - \left(\frac{26-12}{2}\right)^2} = 24$

PTS: 2 REF: 011219ge STA: G.G.40 TOP: Trapezoids

191 ANS: 4 PTS: 2 REF: 061103ge STA: G.G.60
TOP: Identifying Transformations

192 ANS: 2 PTS: 2 REF: 061512ge STA: G.G.19
TOP: Constructions

193 ANS: 2

$V = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi \cdot 3^3 = 36\pi$

PTS: 2 REF: 061112ge STA: G.G.16 TOP: Volume and Surface Area

194 ANS: 2 PTS: 2 REF: 011206ge STA: G.G.32
TOP: Exterior Angle Theorem

195 ANS: 4 PTS: 2 REF: 061114ge STA: G.G.73
TOP: Equations of Circles

196 ANS: 2

The slope of $x + 2y = 3$ is $m = \frac{-A}{B} = \frac{-1}{2}$. $m_{\perp} = 2$.

PTS: 2 REF: 081122ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

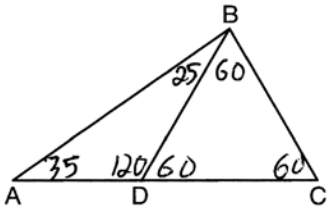
197 ANS: 3

$\frac{180 - 70}{2} = 55$

PTS: 2 REF: 061205ge STA: G.G.52 TOP: Chords and Secants

198 ANS: 3 PTS: 2 REF: 011514ge STA: G.G.72
TOP: Equations of Circles

199 ANS: 1



PTS: 2 REF: 011504ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

Geometry Multiple Choice Regents Exam Questions
Answer Section

200 ANS: 2

$2^2 + 3^2 \neq 4^2$

PTS: 2 REF: 011316ge STA: G.G.48 TOP: Pythagorean Theorem

201 ANS: 4 PTS: 2 REF: 011426ge STA: G.G.73
TOP: Equations of Circles

202 ANS: 3 PTS: 2 REF: 011304ge STA: G.G.61
TOP: Analytical Representations of Transformations

203 ANS: 3

Both pairs of opposite sides are parallel, so not a trapezoid. None of the angles are right angles, so not a rectangle or square. All sides are congruent, so a rhombus.

PTS: 2 REF: 081411ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

204 ANS: 4 PTS: 2 REF: 061410ge STA: G.G.29
TOP: Triangle Congruency

205 ANS: 1 PTS: 2 REF: 061325ge STA: G.G.74
TOP: Graphing Circles

206 ANS: 3

$25 \times 9 \times 12 = 15^2 h$

$2700 = 15^2 h$

$12 = h$

PTS: 2 REF: 061323ge STA: G.G.11 TOP: Volume

207 ANS: 1 PTS: 2 REF: 081514ge STA: G.G.2
TOP: Planes

208 ANS: 1 PTS: 2 REF: 081421ge STA: G.G.25
TOP: Compound Statements KEY: general

209 ANS: 3

$\frac{12}{8} = \frac{21}{x}$ $21 + 14 = 35$

$12x = 168$

$x = 14$

PTS: 2 REF: 061426ge STA: G.G.46 TOP: Side Splitter Theorem

210 ANS: 3 PTS: 2 REF: 081320ge STA: G.G.42
TOP: Midsegments

211 ANS: 3

$3x - 15 = 2(6)$

$3x = 27$

$x = 9$

PTS: 2 REF: 061311ge STA: G.G.42 TOP: Midsegments

212 ANS: 3

Parallel lines intercept congruent arcs.

PTS: 2 REF: 061409ge STA: G.G.52 TOP: Chords and Secants

213 ANS: 4

$(x,y) \rightarrow (-x,-y)$

PTS: 2 REF: 061304ge STA: G.G.54 TOP: Rotations

214 ANS: 3 PTS: 2 REF: 011425ge STA: G.G.39

TOP: Special Parallelograms

215 ANS: 1

$\frac{180-52}{2} = 64.\ 180 - (90 + 64) = 26$

PTS: 2 REF: 011314ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

216 ANS: 3

$\sqrt{20^2 + 7^2} \approx 21$

PTS: 2 REF: 081525ge STA: G.G.50 TOP: Tangents

KEY: point of tangency

217 ANS: 3

$m = \frac{-A}{B} = \frac{-3}{-2} = \frac{3}{2}$

PTS: 2 REF: 011324ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

218 ANS: 2

$x^2 - 2 = x$

$x^2 - x - 2 = 0$

$(x-2)(x+1) = 0$

$x = 2, -1$

PTS: 2 REF: 011409ge STA: G.G.70 TOP: Quadratic-Linear Systems

219 ANS: 3

$x^2 = 4 \cdot 7$

$x = \sqrt{4} \cdot \sqrt{7}$

$x = 2\sqrt{7}$

PTS: 2 REF: 081528ge STA: G.G.47 TOP: Similarity
KEY: leg

220 ANS: 3 PTS: 2 REF: 011322ge STA: G.G.49
TOP: Chords

221 ANS: 2

Parallel chords intercept congruent arcs. $\frac{360 - (104 + 168)}{2} = 44$

PTS: 2 REF: 011302ge STA: G.G.52 TOP: Chords and Secants

222 ANS: 2

$5x + 3 = 7x - 15 \quad 5(9) + 3 = 48$

$18 = 2x$

$9 = x$

PTS: 2 REF: 011515ge STA: G.G.40 TOP: Trapezoids

223 ANS: 3 PTS: 2 REF: 011309ge STA: G.G.20
TOP: Constructions

224 ANS: 1 PTS: 2 REF: 011303ge STA: G.G.24
TOP: Statements

225 ANS: 2

$180(n - 2) = 720$

$n - 2 = 4$

$n = 6$

PTS: 2 REF: 061521ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

226 ANS: 4 PTS: 2 REF: 011318ge STA: G.G.73
TOP: Equations of Circles

227 ANS: 1 PTS: 2 REF: 061527ge STA: G.G.43
TOP: Centroid

228 ANS: 4

$m = \frac{2}{3}$. $2 = -\frac{3}{2}(4) + b$

$m_{\perp} = -\frac{3}{2}$ $2 = -6 + b$

$8 = b$

PTS: 2 REF: 011319ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

229 ANS: 4 PTS: 2 REF: 061423ge STA: G.G.25
TOP: Compound Statements KEY: conditional

230 ANS: 2

$x^2 + 5x = 4x + 110 \quad m\angle Q = 4(10) = 40$

$x^2 + x - 110 = 0$

$(x + 11)(x - 10) = 0$

$10 = x$

PTS: 2 REF: 061425ge STA: G.G.32 TOP: Exterior Angle Theorem

231 ANS: 4

$(n-2)180 - n\left(\frac{(n-2)180}{n}\right) = 180n - 360 - 180n + 180n - 360 = 180n - 720.$

$180(5) - 720 = 180$

PTS: 2 REF: 081322ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

232 ANS: 1

$8 \times 12 = 16x$

$6 = x$

PTS: 2 REF: 081328ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two chords

233 ANS: 3

$2y = 3x - 4. \quad 1 = \frac{3}{2}(6) + b$

$y = \frac{3}{2}x - 2 \quad 1 = 9 + b$

$-8 = b$

PTS: 2 REF: 061316ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

234 ANS: 4 PTS: 2 REF: 081417ge STA: G.G.24
TOP: Statements

235 ANS: 2

Perimeter of $\triangle DEF$ is $5 + 8 + 11 = 24$. $\frac{5}{24} = \frac{x}{60}$

$24x = 300$

$x = 12.5$

PTS: 2 REF: 011307ge STA: G.G.45 TOP: Similarity
KEY: perimeter and area

236 ANS: 1

$k: \frac{-A}{B} = \frac{-1}{2} \quad p: \frac{-A}{B} = \frac{-6}{3} = -2 \quad m: \frac{-A}{B} = \frac{-(-1)}{2} = \frac{1}{2}$

PTS: 2 REF: 081426ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

237 ANS: 2 PTS: 2 REF: 061524ge STA: G.G.71
TOP: Equations of Circles
238 ANS: 2 PTS: 2 REF: 081415ge STA: G.G.67
TOP: Distance KEY: general
239 ANS: 1

$r^2 = 48$

$r = \sqrt{48} = \sqrt{16} \cdot \sqrt{3} = 4\sqrt{3}$

PTS: 2 REF: 081412ge STA: G.G.73 TOP: Equations of Circles
240 ANS: 3

$m = \frac{-A}{B} = \frac{-4}{-2} = 2$ $y = mx + b$

$1 = 2(-2) + b$

$1 = -4 + b$

$5 = b$

PTS: 2 REF: 081509ge STA: G.G.65 TOP: Parallel and Perpendicular Lines
241 ANS: 4

$2x - 8 = x + 2$. $AE = 10 + 2 = 12$. $AC = 2(AE) = 2(12) = 24$

$x = 10$

PTS: 2 REF: 011327ge STA: G.G.39 TOP: Special Parallelograms
242 ANS: 4 PTS: 2 REF: 081308ge STA: G.G.49
TOP: Chords
243 ANS: 1 PTS: 2 REF: 061418ge STA: G.G.3
TOP: Planes
244 ANS: 4

Distance is preserved after a rotation.

PTS: 2 REF: 081304ge STA: G.G.55 TOP: Properties of Transformations
245 ANS: 1 PTS: 2 REF: 011512ge STA: G.G.3
TOP: Planes
246 ANS: 1

$m = \frac{6}{3} = 2$ $m_{\perp} = -\frac{1}{2}$ $4 = -\frac{1}{2}(2) + b$

$4 = -1 + b$

$5 = b$

PTS: 2 REF: 061507ge STA: G.G.64 TOP: Parallel and Perpendicular Lines
247 ANS: 4 PTS: 2 REF: 061319ge STA: G.G.73
TOP: Equations of Circles

248 ANS: 2

Isosceles or not, $\triangle RSV$ and $\triangle RST$ have a common base, and since $\overline{RS}$ and $\overline{VT}$ are bases, congruent altitudes.

PTS: 2 REF: 061301ge STA: G.G.40 TOP: Trapezoids

249 ANS: 2

Parallel secants intercept congruent arcs. $\frac{360-(106+24)}{2}=\frac{230}{2}=115$

PTS: 2 REF: 081503ge STA: G.G.52 TOP: Chords and Secants

250 ANS: 4 PTS: 2 REF: 011406ge STA: G.G.10
TOP: Solids

251 ANS: 2

$180-2(58)=64$

PTS: 2 REF: 081510ge STA: G.G.31 TOP: Isosceles Triangle Theorem

252 ANS: 2 PTS: 2 REF: 081421ge STA: G.G.65
TOP: Parallel and Perpendicular Lines

253 ANS: 1 PTS: 2 REF: 011423ge STA: G.G.71
TOP: Equations of Circles

254 ANS: 2

$18\pi \cdot 42 \approx 2375$

PTS: 2 REF: 011418ge STA: G.G.14 TOP: Volume and Lateral Area

255 ANS: 4

$3x+17+5x-21=180$ $\text{m}\angle 1=3(23)+17=86$

$8x-4=180$

$8x=184$

$x=23$

PTS: 2 REF: 011513ge STA: G.G.35 TOP: Parallel Lines and Transversals

256 ANS: 3 PTS: 2 REF: 081312ge STA: G.G.72
TOP: Equations of Circles

257 ANS: 1

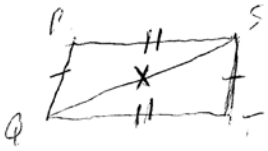
$12(8)=x(6)$

$96=6x$

$16=x$

PTS: 2 REF: 061328ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two secants

258 ANS: 3



PTS: 2 REF: 081402ge STA: G.G.38 TOP: Parallelograms

259 ANS: 1

$(2,-7) \rightarrow (2-3,-7+5) = (-1,-2)$

PTS: 2 REF: 061504ge STA: G.G.61
TOP: Analytical Representations of Transformations

260 ANS: 4 PTS: 2 REF: 011428ge STA: G.G.50
TOP: Tangents KEY: common tangency

261 ANS: 1 PTS: 2 REF: 061523ge STA: G.G.34
TOP: Angle Side Relationship

262 ANS: 1

$d = \sqrt{(5-1)^2 + (3-6)^2} = \sqrt{16+9} = \sqrt{25} = 5$

PTS: 2 REF: 011507ge STA: G.G.67 TOP: Distance
KEY: general

263 ANS: 3

$d = \sqrt{(-2-4)^2 + (3-5)^2} = \sqrt{36+4} = \sqrt{40} = 2\sqrt{10}$

PTS: 2 REF: 061411ge STA: G.G.67 TOP: Distance
KEY: general

264 ANS: 3

$180 - 38 = 142$

PTS: 2 REF: 011419ge STA: G.G.50 TOP: Tangents
KEY: two tangents

265 ANS: 2 PTS: 2 REF: 081316ge STA: G.G.23
TOP: Locus

266 ANS: 2

$180 - 2(66) = 48$

PTS: 2 REF: 061513ge STA: G.G.50 TOP: Tangents
KEY: two tangents

267 ANS: 2

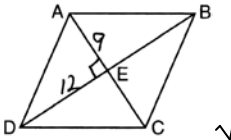
$M_x = \frac{8+(-3)}{2} = 2.5.\ M_Y = \frac{-4+2}{2} = -1.$

PTS: 2 REF: 061312ge STA: G.G.66 TOP: Midpoint

268 ANS: 3 PTS: 2 REF: 081502ge STA: G.G.73
TOP: Equations of Circles

269 ANS: 1 PTS: 2 REF: 081513ge STA: G.G.26
TOP: Contrapositive

270 ANS: 1



$\sqrt{9^2 + 12^2} = 15$

PTS: 2 REF: 011505ge STA: G.G.39 TOP: Special Parallelograms

271 ANS: 3 PTS: 2 REF: 011427ge STA: G.G.56
TOP: Identifying Transformations

272 ANS: 3 PTS: 2 REF: 081405ge STA: G.G.56
TOP: Identifying Transformations

273 ANS: 1

Parallel chords intercept congruent arcs. $\text{m}\overset{\frown}{AC} = \text{m}\overset{\frown}{BD}$. $\frac{180 - 110}{2} = 35.$

PTS: 2 REF: 081302ge STA: G.G.52 TOP: Chords and Secants

274 ANS: 4
$3 + 6 > 8$

PTS: 2 REF: 061416ge STA: G.G.33 TOP: Triangle Inequality Theorem

275 ANS: 4 PTS: 2 REF: 011528ge STA: G.G.44
TOP: Similarity Proofs

276 ANS: 2
$\sqrt{(-2-4)^2 + (-3-(-1))^2} = \sqrt{40} = \sqrt{4}\sqrt{10} = 2\sqrt{10}$

PTS: 2 REF: 011313ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

277 ANS: 4
$\frac{2}{3}(x-4) = y - 5$

$2x - 8 = 3y - 15$

$7 = 3y - 2x$

PTS: 2 REF: 061528ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

278 ANS: 3
$120\pi = \pi(12)(l)$

$10 = l$

PTS: 2 REF: 081314ge STA: G.G.15 TOP: Volume and Lateral Area

279 ANS: 3 PTS: 2 REF: 061526ge STA: G.G.26
TOP: Inverse

280 ANS: 2 PTS: 2 REF: 011511ge STA: G.G.71
TOP: Equations of Circles

281 ANS: 3

$6 = \frac{4+x}{2}. \qquad 8 = \frac{2+y}{2}.$

$4 + x = 12 \qquad 2 + y = 16$

$x = 8 \qquad y = 14$

PTS: 2 REF: 011305ge STA: G.G.66 TOP: Midpoint

282 ANS: 4

$2x + 36 + 7x - 9 = 180 \quad m\angle 1 = 2(17) + 36 = 70$

$9x + 27 = 180$

$9x = 153$

$x = 17$

PTS: 2 REF: 081427ge STA: G.G.35 TOP: Parallel Lines and Transversals

283 ANS: 3

$\frac{4}{2+3+4} \times 180 = 80$

PTS: 2 REF: 061404ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

284 ANS: 2

$\frac{(n-2)180}{n} = 120$.

$180n - 360 = 120n$

$60n = 360$

$n = 6$

PTS: 2 REF: 011326ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

285 ANS: 4 PTS: 2 REF: 011421ge STA: G.G.54
TOP: Rotations

286 ANS: 4

$M_x = \frac{2+8}{2} = 5. \quad M_Y = \frac{-5+3}{2} = -1.$

PTS: 2 REF: 011502ge STA: G.G.66 TOP: Midpoint
KEY: general

287 ANS: 3 PTS: 2 REF: 061401ge STA: G.G.9
TOP: Planes

288 ANS: 3 PTS: 2 REF: 081419ge STA: G.G.39
TOP: Special Parallelograms

289 ANS: 1 PTS: 2 REF: 081303ge STA: G.G.24
TOP: Negations

290 ANS: 2
$m\angle ABC = 55$, so $m\angle ACR = 60 + 55 = 115$

PTS: 2 REF: 011414ge STA: G.G.32 TOP: Exterior Angle Theorem

291 ANS: 3

$144\pi = 4\pi r^2$

$36 = r^2$

$6 = r$

PTS: 2 REF: 061415ge STA: G.G.16 TOP: Volume and Surface Area

292 ANS: 2 PTS: 2 REF: 081504ge STA: G.G.61
TOP: Analytical Representations of Transformations

293 ANS: 1

$\left(\frac{2+2}{2}, \frac{0+(-8)}{2}\right) = (2,-4)$ $\sqrt{(2-2)^2 + (-8-0)^2} = 8 = d$

$4 = r$

$16 = r^2$

PTS: 2 REF: 061428ge STA: G.G.71 TOP: Equations of Circles

294 ANS: 2 PTS: 2 REF: 061324ge STA: G.G.44
TOP: Similarity Proofs

295 ANS: 1 PTS: 2 REF: 081522ge STA: G.G.22
TOP: Locus

296 ANS: 4

$180 - \frac{180-80}{2} = 130$

PTS: 2 REF: 011508ge STA: G.G.31 TOP: Isosceles Triangle Theorem

297 ANS: 1 PTS: 2 REF: 011404ge STA: G.G.9
TOP: Planes

298 ANS: 3

$M_x = \frac{1+10}{2} = \frac{11}{2} = 5.5$ $M_y = \frac{3+7}{2} = \frac{10}{2} = 5.$

PTS: 2 REF: 081407ge STA: G.G.66 TOP: Midpoint
KEY: graph

299 ANS: 2 PTS: 2 REF: 061305ge STA: G.G.18
TOP: Constructions

300 ANS: 4

$2x+3=-x^2-x+1 \quad y=2(-2)+3=-1$

$x^2+3x+2=0$

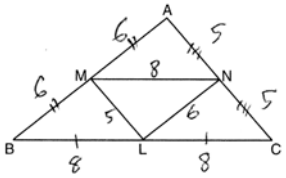
$(x+2)(x+1)=0$

$x=-2,-1$

PTS: 2 REF: 081516ge STA: G.G.70 TOP: Quadratic-Linear Systems

301 ANS: 1 PTS: 2 REF: 061307ge STA: G.G.55
TOP: Properties of Transformations

302 ANS: 4



PTS: 2 REF: 061520ge STA: G.G.42 TOP: Midsegments

303 ANS: 3 PTS: 2 REF: 061320ge STA: G.G.35
TOP: Parallel Lines and Transversals

304 ANS: 3

$2(4x+20)+2(3x-15)=360. \quad \angle D=3(25)-15=60$

$8x+40+6x-30=360$

$14x+10=360$

$14x=350$

$x=25$

PTS: 2 REF: 011321ge STA: G.G.40 TOP: Trapezoids

305 ANS: 1 PTS: 2 REF: 061514ge STA: G.G.3
TOP: Planes

306 ANS: 4 PTS: 2 REF: 011306ge STA: G.G.9
TOP: Planes

307 ANS: 4
(2) rotation is also a correct response

PTS: 2 REF: 011527ge STA: G.G.56 TOP: Identifying Transformations

308 ANS: 2

$x+x+x+15=180$

$3x+15=180$

$3x=165$

$x=15$

PTS: 2 REF: 061407ge STA: G.G.31 TOP: Isosceles Triangle Theorem

309 ANS: 2

$2 = \frac{10 + x}{2}$. $8 = \frac{12 + y}{2}$

$4 = 10 + x$ $16 = 12 + y$

$-6 = x$ $4 = y$

PTS: 2 REF: 061505ge STA: G.G.66 TOP: Midpoint

310 ANS: 3

$V = \frac{2}{3}\pi\left(\frac{12}{2}\right)^3 \approx 905$

PTS: 2 REF: 061502ge STA: G.G.16 TOP: Volume and Surface Area

311 ANS: 1 PTS: 2 REF: 081323ge STA: G.G.9
TOP: Planes

312 ANS: 2

$5x - 22 = 3x + 10$

$2x = 32$

$x = 16$

PTS: 2 REF: 061403ge STA: G.G.35 TOP: Parallel Lines and Transversals

313 ANS: 3 PTS: 2 REF: 061421ge STA: G.G.55
TOP: Properties of Transformations

314 ANS: 2

$x + 2x = x^2$ $(0,0),(3,3)$

$0 = x^2 - 3x$

$0 = x(x - 3)$

$x = 0, 3$

PTS: 2 REF: 061406ge STA: G.G.70 TOP: Quadratic-Linear Systems

315 ANS: 3

$2.4 + 2(2.4) = 7.2$

PTS: 2 REF: 081526ge STA: G.G.43 TOP: Centroid

316 ANS: 1

Parallel lines intercept congruent arcs.

PTS: 2 REF: 081413ge STA: G.G.52 TOP: Chords and Secants

317 ANS: 4 PTS: 2 REF: 081409ge STA: G.G.72
TOP: Equations of Circles

318 ANS: 1 PTS: 2 REF: 061408ge STA: G.G.72
TOP: Equations of Circles

319 ANS: 1

$\frac{70-20}{2} = 25$

PTS: 2 REF: 011325ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: outside circle

320 ANS: 4

$9x - 10 = 5x + 30 \quad 5(10) + 30 = 80$

$4x = 40$

$x = 10$

PTS: 2 REF: 011525ge STA: G.G.52 TOP: Chords and Secants

321 ANS: 4

$11 - 7 = 4, 11 + 7 = 18$

PTS: 2 REF: 061525ge STA: G.G.33 TOP: Triangle Inequality Theorem

322 ANS: 2

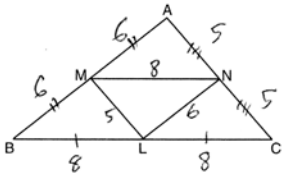
The slope of $2x + 4y = 12$ is $m = \frac{-A}{B} = \frac{-2}{4} = -\frac{1}{2}$. $m_{\perp} = 2$.

PTS: 2 REF: 011310ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

323 ANS: 2 PTS: 2 REF: 081301ge STA: G.G.24
TOP: Statements

324 ANS: 1 PTS: 2 REF: 081518ge STA: G.G.51
TOP: Arcs Determined by Angles KEY: inscribed

325 ANS: 1



PTS: 2 REF: 011413ge STA: G.G.42 TOP: Midsegments

326 ANS: 3 PTS: 2 REF: 081410ge STA: G.G.47
TOP: Similarity KEY: altitude

327 ANS: 2 PTS: 2 REF: 081425ge STA: G.G.74
TOP: Graphing Circles

328 ANS: 3

$x + 40 = 2x + 20 \quad GH = 2(20) + 20 = 60$

$20 = x$

PTS: 2 REF: 081416ge STA: G.G.31 TOP: Isosceles Triangle Theorem

329 ANS: 4 PTS: 2 REF: 011501ge STA: G.G.70
TOP: Quadratic-Linear Systems

330 ANS: 2 PTS: 2 REF: 011317ge STA: G.G.22
TOP: Locus

331 ANS: 3

$$\frac{4}{6} = \frac{x+2}{4x-7}$$

$16x - 28 = 6x + 12$

$10x = 40$

$x = 4$

PTS: 2 REF: 011521ge STA: G.G.46 TOP: Side Splitter Theorem

332 ANS: 2 PTS: 2 REF: 081306ge STA: G.G.34
TOP: Angle Side Relationship

333 ANS: 3

$AB = 8 - 4 = 4.\ BC = \sqrt{(-2-(-5))^2 + (8-6)^2} = \sqrt{13}.\ AC = \sqrt{(-2-(-5))^2 + (4-6)^2} = \sqrt{13}$

PTS: 2 REF: 011328ge STA: G.G.69 TOP: Triangles in the Coordinate Plane

334 ANS: 3 PTS: 2 REF: 011506ge STA: G.G.24
TOP: Negations

335 ANS: 4 PTS: 2 REF: 011415ge STA: G.G.72
TOP: Equations of Circles

336 ANS: 3

$x^2 = 8 \times 18$

$x^2 = 144$

$x = 12$

PTS: 2 REF: 061506ge STA: G.G.47 TOP: Similarity
KEY: altitude

337 ANS: 3 PTS: 2 REF: 061309ge STA: G.G.72
TOP: Equations of Circles

338 ANS: 2

$(x-4)^2 - 2 = -2x + 6.\ \ y = -2(4) + 6 = -2$

$x^2 - 8x + 16 - 2 = -2x + 6 \quad y = -2(2) + 6 = 2$

$x^2 - 6x + 8 = 0$

$(x-4)(x-2) = 0$

$x = 4, 2$

PTS: 2 REF: 081319ge STA: G.G.70 TOP: Quadratic-Linear Systems

339 ANS: 3

$$\frac{15}{18} = \frac{5}{6}$$

PTS: 2 REF: 081317ge STA: G.G.45 TOP: Similarity
KEY: perimeter and area

340 ANS: 3

$3x + 1 + 4x - 17 + 5x - 20 = 180$. $3(18) + 1 = 55$

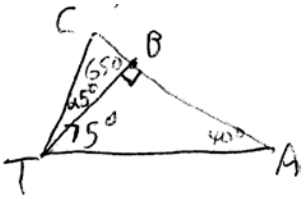
$12x - 36 = 180$ $4(18) - 17 = 55$

$12x = 216$ $5(18) - 20 = 70$

$x = 18$

PTS: 2 REF: 061308ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

341 ANS: 2



PTS: 2 REF: 081422ge STA: G.G.34 TOP: Angle Side Relationship

342 ANS: 1

$M_x = \frac{-5+3}{2} = \frac{-2}{2} = -1$. $M_y = \frac{1+5}{2} = \frac{6}{2} = 3$.

PTS: 2 REF: 061402ge STA: G.G.66 TOP: Midpoint

343 ANS: 2

$m = \frac{1}{3}$ $12 = -3(-9) + b$

$m_{\perp} = -3$ $12 = 27 + b$

$-15 = b$

PTS: 2 REF: 081404ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

344 ANS: 3

$L = 2\pi rh = 2\pi \cdot \frac{6}{2} \cdot 15 = 90\pi$

PTS: 2 REF: 061405ge STA: G.G.14 TOP: Volume and Lateral Area

345 ANS: 3 PTS: 2 REF: 011523ge STA: G.G.51
TOP: Arcs Determined by Angles KEY: inscribed

346 ANS: 1

$\text{m}\angle A + \text{m}\angle B = 50$

$30.1 + \text{m}\angle B = 50$

$\text{m}\angle B = 19.9$

PTS: 2 REF: 081424ge STA: G.G.32 TOP: Exterior Angle Theorem

347 ANS: 2 PTS: 2 REF: 011517ge STA: G.G.26
TOP: Contrapositive

348 ANS: 3

midpoint: $\left(\frac{6+8}{2}, \frac{8+4}{2}\right) = (7,6)$. slope: $\frac{8-4}{6-8} = \frac{4}{-2} = -2$; $m_{\perp} = \frac{1}{2}$. $6 = \frac{1}{2}(7) + b$

$\frac{12}{2} = \frac{7}{2} + b$

$\frac{5}{12} = b$

PTS: 2 REF: 081327ge STA: G.G.68 TOP: Perpendicular Bisector

349 ANS: 4

$8^2 + 15^2 = 17^2$

PTS: 2 REF: 081418ge STA: G.G.48 TOP: Pythagorean Theorem

350 ANS: 2 PTS: 2 REF: 011411ge STA: G.G.27
TOP: Quadrilateral Proofs

351 ANS: 2

$m = \frac{-A}{B} = \frac{-5}{1} = -5$ $y = mx + b$

$3 = -5(5) + b$

$28 = b$

PTS: 2 REF: 011410ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

352 ANS: 3 PTS: 2 REF: 061424ge STA: G.G.43
TOP: Centroid

353 ANS: 2

$180 - \frac{(n-2)180}{n} = 45$

$180n - 180n + 360 = 45n$

$360 = 45n$

$n = 8$

PTS: 2 REF: 061413ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

354 ANS: 4 PTS: 2 REF: 011315ge STA: G.G.1
TOP: Planes

355 ANS: 4 PTS: 2 REF: 061303ge STA: G.G.22
TOP: Locus

356 ANS: 1 PTS: 2 REF: 011301ge STA: G.G.29
TOP: Triangle Congruency

357 ANS: 1 PTS: 2 REF: 061314ge STA: G.G.26
TOP: Converse and Biconditional

358 ANS: 1

$2x + x = 12$. $\overline{BD} = 2(4) = 8$

$3x = 12$

$x = 4$

PTS: 2 REF: 011408ge STA: G.G.43 TOP: Centroid

359 ANS: 3 PTS: 2 REF: 011402ge STA: G.G.17
TOP: Constructions

360 ANS: 2

$m = \frac{-A}{B} = \frac{-2}{3}$ $m_{\perp} = \frac{3}{2}$

PTS: 2 REF: 061417ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

361 ANS: 1 PTS: 2 REF: 011320ge STA: G.G.26
TOP: Conditional Statements

362 ANS: 2

$m = \frac{-A}{B} = \frac{-3}{-7} = \frac{3}{7}$ $m_{\perp} = -\frac{7}{3}$

PTS: 2 REF: 081414ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

363 ANS: 3

$r^2 = 50$

$r = \sqrt{50} = \sqrt{25}\sqrt{2} = 5\sqrt{2}$

PTS: 2 REF: 061515ge STA: G.G.73 TOP: Equations of Circles

364 ANS: 3 PTS: 2 REF: 081309ge STA: G.G.29
TOP: Triangle Congruency

365 ANS: 1 PTS: 2 REF: 011416ge STA: G.G.34
TOP: Angle Side Relationship

366 ANS: 4 PTS: 2 REF: 011407ge STA: G.G.23
TOP: Locus

367 ANS: 3

The regular polygon with the smallest interior angle is an equilateral triangle, with 60º. 180° – 60° = 120°

PTS: 2 REF: 011417ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

368 ANS: 1 PTS: 2 REF: 081324ge STA: G.G.74
TOP: Graphing Circles

369 ANS: 2 PTS: 2 REF: 061427ge STA: G.G.27
TOP: Line Proofs

370 ANS: 4 PTS: 2 REF: 081403ge STA: G.G.49
TOP: Chords

371 ANS: 2

$s^2 + s^2 = (3\sqrt{2})^2$

$2s^2 = 18$

$s^2 = 9$

$s = 3$

PTS: 2 REF: 011420ge STA: G.G.39 TOP: Special Parallelograms

372 ANS: 3

$180 - \frac{(n-2)180}{n} = 40$

$180n - 180n + 360 = 40n$

$360 = 40n$

$n = 9$

PTS: 2 REF: 061519ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

373 ANS: 1 PTS: 2 REF: 011412ge STA: G.G.28
TOP: Triangle Congruency

374 ANS: 2

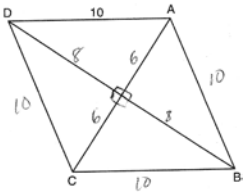
$45 \cdot \frac{8}{20} = 18$

PTS: 2 REF: 081511ge STA: G.G.45 TOP: Similarity
KEY: perimeter and area

375 ANS: 1 PTS: 2 REF: 061310ge STA: G.G.2
TOP: Planes

376 ANS: 4 PTS: 2 REF: 061422ge STA: G.G.73
TOP: Equations of Circles

377 ANS: 2



PTS: 2 REF: 061414ge STA: G.G.39 TOP: Special Parallelograms

378 ANS: 2 PTS: 2 REF: 061313ge STA: G.G.70
TOP: Quadratic-Linear Systems

379 ANS: 3 PTS: 2 REF: 011311ge STA: G.G.42
TOP: Midsegments

380 ANS: 2

$L + L - 30 = 180$

$2L = 210$

$L = 105$

PTS: 2 REF: 081519ge STA: G.G.38 TOP: Parallelograms

381 ANS: 4 PTS: 2 REF: 081305ge STA: G.G.71
TOP: Equations of Circles

382 ANS: 2 PTS: 2 REF: 061321ge STA: G.G.34
TOP: Angle Side Relationship

383 ANS: 1 PTS: 2 REF: 061517ge STA: G.G.45
TOP: Similarity KEY: perimeter and area

384 ANS: 2

(1) is true because of vertical angles. (3) and (4) are true because CPCTC.

PTS: 2 REF: 061302ge STA: G.G.29 TOP: Triangle Congruency

385 ANS: 4

$6x = x + 40 + 3x + 10$. $\text{m}\angle CAB = 25 + 40 = 65$

$6x = 4x + 50$

$2x = 50$

$x = 25$

PTS: 2 REF: 081310ge STA: G.G.32 TOP: Exterior Angle Theorem

386 ANS: 1

If two prisms have equal heights and volume, the area of their bases is equal.

PTS: 2 REF: 081321ge STA: G.G.11 TOP: Volume

387 ANS: 3

$x^2 + 5^2 = 25$

$x = 0$

PTS: 2 REF: 011312ge STA: G.G.70 TOP: Quadratic-Linear Systems

388 ANS: 4 PTS: 2 REF: 061412ge STA: G.G.24
TOP: Negations

389 ANS: 2

$(n-2)180 = (8-2)180 = 1080$. $\frac{1080}{8} = 135$.

PTS: 2 REF: 081521ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

390 ANS: 4 PTS: 2 REF: 011403ge STA: G.G.73
TOP: Equations of Circles

391 ANS: 4 PTS: 2 REF: 081318ge STA: G.G.26
TOP: Converse and Biconditional

392 ANS: 2

$\sqrt{8^2 + 15^2} = 17$

PTS: 2 REF: 061326ge STA: G.G.39 TOP: Special Parallelograms

393 ANS: 1

$m = \frac{-A}{B} = \frac{1}{2}$ $-1 = \frac{1}{2}(4) + b$

$-1 = 2 + b$

$-3 = b$

PTS: 2 REF: 061420ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

394 ANS: 2 PTS: 2 REF: 061315ge STA: G.G.13
TOP: Solids

395 ANS: 3 PTS: 2 REF: 061306ge STA: G.G.71
TOP: Equations of Circles

396 ANS: 1

$V = \frac{4}{3}\pi r^3$

$44.6022 = \frac{4}{3}\pi r^3$

$10.648 \approx r^3$

$2.2 \approx r$

PTS: 2 REF: 061317ge STA: G.G.16 TOP: Volume and Surface Area

397 ANS: 4 PTS: 2 REF: 081408ge STA: G.G.55
TOP: Properties of Transformations

398 ANS: 1

$x^2 + 5 = x + 5$ $y = (0) + 5 = 5$

$x^2 - x = 0$ $y = (1) + 5 = 6$

$x(x - 1) = 0$

$x = 0, 1$

PTS: 2 REF: 081406ge STA: G.G.70 TOP: Quadratic-Linear Systems

399 ANS: 2

$\frac{6 + x}{2} = 4.$ $\frac{-4 + y}{2} = 2$

$x = 2$ $y = 8$

PTS: 2 REF: 011401ge STA: G.G.66 TOP: Midpoint

400 ANS: 4

$m_{\overleftrightarrow{AB}} = \frac{6-3}{7-5} = \frac{3}{2}.\ m_{\overleftrightarrow{CD}} = \frac{4-0}{6-9} = \frac{4}{-3}$

PTS: 2 REF: 061318ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

401 ANS: 3

$720 = 5B$

$144 = B$

PTS: 2 REF: 081523ge STA: G.G.11 TOP: Volume

402 ANS: 2

$\frac{3}{6} = \frac{5}{x}$

$3x = 30$

$x = 10$

PTS: 2 REF: 081423ge STA: G.G.46 TOP: Side Splitter Theorem

403 ANS: 1

$7x - 36 + 5x + 12 = 180$

$12x - 24 = 180$

$12x = 204$

$x = 17$

PTS: 2 REF: 011422ge STA: G.G.35 TOP: Parallel Lines and Transversals

404 ANS: 2

$\sqrt{17^2 - 15^2} = \sqrt{289 - 225} = \sqrt{64} = 8$

PTS: 2 REF: 011424ge STA: G.G.49 TOP: Chords

405 ANS: 3

$x^2 = 2(2 + 10)$

$x^2 = 24$

$x = \sqrt{24} = \sqrt{4}\sqrt{6} = 2\sqrt{6}$

PTS: 2 REF: 081326ge STA: G.G.47 TOP: Similarity
KEY: leg

406 ANS: 1

$x^2 = 3 \times 12$

$x = 6$

PTS: 2 REF: 011308ge STA: G.G.47 TOP: Similarity
KEY: altitude

407 ANS: 1 PTS: 2 REF: 061510ge STA: G.G.72
TOP: Equations of Circles
408 ANS: 2
$\sqrt{15^2 - 12^2} = 9$

PTS: 2 REF: 081325ge STA: G.G.50 TOP: Tangents
KEY: point of tangency
409 ANS: 4 PTS: 2 REF: 081401ge STA: G.G.10
TOP: Solids
410 ANS: 4 PTS: 2 REF: 081313ge STA: G.G.19
TOP: Constructions
411 ANS: 3
The centroid divides each median into segments whose lengths are in the ratio 2 : 1.

PTS: 2 REF: 081307ge STA: G.G.43 TOP: Centroid
412 ANS: 2 PTS: 2 REF: 081311ge STA: G.G.10
TOP: Solids
413 ANS: 1
$256 = \frac{1}{3} B \cdot 12$

$64 = B$

$8 = s$

PTS: 2 REF: 081428ge STA: G.G.35 TOP: Volume
414 ANS: 4 PTS: 2 REF: 011323ge STA: G.G.72
TOP: Equations of Circles
415 ANS: 2 PTS: 2 REF: 081520ge STA: G.G.72
TOP: Equations of Circles
416 ANS: 1
$180 - 123 = 57$

PTS: 2 REF: 061419ge STA: G.G.40 TOP: Trapezoids
417 ANS: 3
$x^2 = 3 \times 12$. $\sqrt{6^2 + 3^2} = \sqrt{45} = \sqrt{9}\sqrt{5} = 3\sqrt{5}$

$x = 6$

PTS: 2 REF: 061327ge STA: G.G.47 TOP: Similarity
KEY: leg
418 ANS: 1 PTS: 2 REF: 011405ge STA: G.G.59
TOP: Properties of Transformations

419 ANS: 4

$3y + 6 = 2x \qquad 2y - 3x = 6$

$3y = 2x - 6 \qquad 2y = 3x + 6$

$y = \frac{2}{3}x - 2 \qquad y = \frac{3}{2}x + 3$

$m = \frac{2}{3} \qquad m = \frac{3}{2}$

PTS: 2 REF: 081315ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

Geometry Multiple Choice Regents Exam Questions
Answer Section

420 ANS: 4 PTS: 2 REF: 080915ge STA: G.G.56
TOP: Identifying Transformations

421 ANS: 1
Parallel lines intercept congruent arcs.

PTS: 2 REF: 061001ge STA: G.G.52 TOP: Chords and Secants

422 ANS: 2 PTS: 2 REF: 061007ge STA: G.G.35
TOP: Parallel Lines and Transversals

423 ANS: 2 PTS: 2 REF: 011006ge STA: G.G.56
TOP: Identifying Transformations

424 ANS: 1
The closer a chord is to the center of a circle, the longer the chord.

PTS: 2 REF: 011005ge STA: G.G.49 TOP: Chords

425 ANS: 2

$M_x = \frac{-2+6}{2} = 2.\ M_y = \frac{-4+2}{2} = -1$

PTS: 2 REF: 080910ge STA: G.G.66 TOP: Midpoint
KEY: general

426 ANS: 4

$\text{SA} = 4\pi r^2 \quad V = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi \cdot 6^3 = 288\pi$

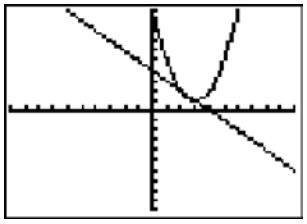
$144\pi = 4\pi r^2$

$36 = r^2$

$6 = r$

PTS: 2 REF: 081020ge STA: G.G.16 TOP: Surface Area

427 ANS: 4



$y + x = 4$. $x^2 - 6x + 10 = -x + 4.\ y + x = 4.\ y + 2 = 4$

$y = -x + 4 \qquad x^2 - 5x + 6 = 0 \qquad y + 3 = 4 \qquad y = 2$

$(x-3)(x-2) = 0 \qquad y = 1$

$x = 3 \text{ or } 2$

PTS: 2 REF: 080912ge STA: G.G.70 TOP: Quadratic-Linear Systems

428 ANS: 4

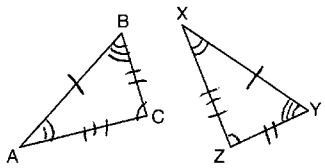
The slope of $y = -3x + 2$ is -3. The perpendicular slope is $\frac{1}{3}$. $-1 = \frac{1}{3}(3) + b$

$-1 = 1 + b$

$b = -2$

PTS: 2 REF: 011018ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

429 ANS: 4



PTS: 2 REF: 081001ge STA: G.G.29 TOP: Triangle Congruency

430 ANS: 3

$4(x + 4) = 8^2$

$4x + 16 = 64$

$x = 12$

PTS: 2 REF: 060916ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: tangent and secant

431 ANS: 1 PTS: 2 REF: 080911ge STA: G.G.73
TOP: Equations of Circles

432 ANS: 3 PTS: 2 REF: 011007ge STA: G.G.31
TOP: Isosceles Triangle Theorem

433 ANS: 2 PTS: 2 REF: 061002ge STA: G.G.24
TOP: Negations

434 ANS: 3

$(x + 3)^2 - 4 = 2x + 5$

$x^2 + 6x + 9 - 4 = 2x + 5$

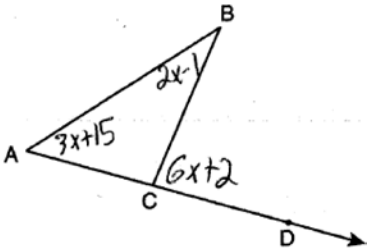
$x^2 + 4x = 0$

$x(x + 4) = 0$

$x = 0, -4$

PTS: 2 REF: 081004ge STA: G.G.70 TOP: Quadratic-Linear Systems

435 ANS: 1



$3x + 15 + 2x - 1 = 6x + 2$

$5x + 14 = 6x + 2$

$x = 12$

PTS: 2 REF: 011021ge STA: G.G.32 TOP: Exterior Angle Theorem

436 ANS: 2 PTS: 2 REF: 080921ge STA: G.G.72
TOP: Equations of Circles

437 ANS: 1 PTS: 2 REF: 060920ge STA: G.G.74
TOP: Graphing Circles

438 ANS: 1

$a^2 + (5\sqrt{2})^2 = (2\sqrt{15})^2$

$a^2 + (25 \times 2) = 4 \times 15$

$a^2 + 50 = 60$

$a^2 = 10$

$a = \sqrt{10}$

PTS: 2 REF: 011016ge STA: G.G.48 TOP: Pythagorean Theorem

439 ANS: 3 PTS: 2 REF: 081021ge STA: G.G.57
TOP: Properties of Transformations

440 ANS: 3

$2y = -6x + 8$ Perpendicular lines have slope the opposite and reciprocal of each other.

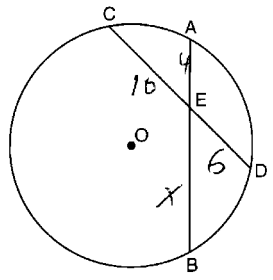
$y = -3x + 4$

$m = -3$

$m_{\perp} = \frac{1}{3}$

PTS: 2 REF: 081024ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

441 ANS: 1



$4x = 6 \cdot 10$

$x = 15$

PTS: 2 REF: 081017ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two chords

442 ANS: 2 PTS: 2 REF: 081015ge STA: G.G.56
TOP: Identifying Transformations

443 ANS: 2 PTS: 2 REF: fall0806ge STA: G.G.9
TOP: Planes

444 ANS: 3 PTS: 2 REF: 060908ge STA: G.G.60
TOP: Identifying Transformations

445 ANS: 1

$-2\left(-\frac{1}{2}y = 6x + 10\right)$

$y = -12x - 20$

PTS: 2 REF: 061027ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

446 ANS: 1
Translations and reflections do not affect distance.

PTS: 2 REF: 080908ge STA: G.G.61
TOP: Analytical Representations of Transformations

447 ANS: 2 PTS: 2 REF: 080927ge STA: G.G.4
TOP: Planes

448 ANS: 4
(4) is not true if $\angle PQR$ is obtuse.

PTS: 2 REF: 060924ge STA: G.G.32 TOP: Exterior Angle Theorem

449 ANS: 3 PTS: 2 REF: fall0816ge STA: G.G.1
TOP: Planes

450 ANS: 1

$x + 2x + 2 + 3x + 4 = 180$

$6x + 6 = 180$

$x = 29$

PTS: 2 REF: 011002ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

451 ANS: 2

The slope of $2x + 3y = 12$ is $-\frac{A}{B} = -\frac{2}{3}$. The slope of a perpendicular line is $\frac{3}{2}$. Rewritten in slope intercept form, (2) becomes $y = \frac{3}{2}x + 3$.

PTS: 2 REF: 060926ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

452 ANS: 4

$M_x = \frac{-6+1}{2} = -\frac{5}{2}$. $M_y = \frac{1+8}{2} = \frac{9}{2}$.

PTS: 2 REF: 060919ge STA: G.G.66 TOP: Midpoint
KEY: graph

453 ANS: 4 PTS: 2 REF: 081023ge STA: G.G.45
TOP: Similarity KEY: perimeter and area

454 ANS: 4

$180 - (40 + 40) = 100$

PTS: 2 REF: 080903ge STA: G.G.31 TOP: Isosceles Triangle Theorem

455 ANS: 3

$V = \pi r^2 h = \pi \cdot 6^2 \cdot 27 = 972\pi$

PTS: 2 REF: 011027ge STA: G.G.14 TOP: Volume and Lateral Area

456 ANS: 1 PTS: 2 REF: 061005ge STA: G.G.55
TOP: Properties of Transformations

457 ANS: 1

If $\angle A$ is at minimum (50°) and $\angle B$ is at minimum (90°), $\angle C$ is at maximum of 40° (180° - (50° + 90°)). If $\angle A$ is at maximum (60°) and $\angle B$ is at maximum (100°), $\angle C$ is at minimum of 20° (180° - (60° + 100°)).

PTS: 2 REF: 060901ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

458 ANS: 1 PTS: 2 REF: 061010ge STA: G.G.34
TOP: Angle Side Relationship

459 ANS: 1

The centroid divides each median into segments whose lengths are in the ratio 2 : 1.

$$\overline{GC} = 2\overline{FG}$$
$$\overline{GC} + \overline{FG} = 24$$
$$2\overline{FG} + \overline{FG} = 24$$
$$3\overline{FG} = 24$$
$$\overline{FG} = 8$$

PTS: 2 REF: 081018ge STA: G.G.43 TOP: Centroid

460 ANS: 2 PTS: 2 REF: 011003ge STA: G.G.55
TOP: Properties of Transformations

461 ANS: 1 PTS: 2 REF: fall0807ge STA: G.G.19
TOP: Constructions

462 ANS: 2

The length of the midsegment of a trapezoid is the average of the lengths of its bases. $\frac{x+30}{2} = 44.$

$$x + 30 = 88$$
$$x = 58$$

PTS: 2 REF: 011001ge STA: G.G.40 TOP: Trapezoids

463 ANS: 4

$3y + 1 = 6x + 4.$ $2y + 1 = x - 9$

$3y = 6x + 3$ $2y = x - 10$

$y = 2x + 1$ $y = \frac{1}{2}x - 5$

PTS: 2 REF: fall0822ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

464 ANS: 4 PTS: 2 REF: 080914ge STA: G.G.7
TOP: Planes

465 ANS: 3

The diagonals of an isosceles trapezoid are congruent. $5x + 3 = 11x - 5.$

$$6x = 18$$
$$x = 3$$

PTS: 2 REF: fall0801ge STA: G.G.40 TOP: Trapezoids

466 ANS: 4 PTS: 2 REF: fall0824ge STA: G.G.50
TOP: Tangents KEY: common tangency

467 ANS: 4

The slope of $y = -\frac{2}{3}x - 5$ is $-\frac{2}{3}$. Perpendicular lines have slope that are opposite reciprocals.

PTS: 2 REF: 080917ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

468 ANS: 1 PTS: 2 REF: 061013ge STA: G.G.50
TOP: Tangents KEY: point of tangency

469 ANS: 1

Since $\overline{AC} \cong \overline{BC}$, $m\angle A = m\angle B$ under the Isosceles Triangle Theorem.

PTS: 2 REF: fall0809ge STA: G.G.69 TOP: Triangles in the Coordinate Plane

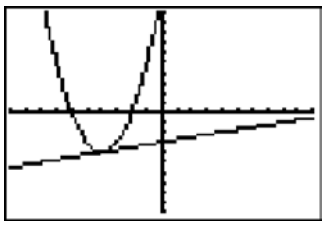
470 ANS: 2 PTS: 2 REF: 061022ge STA: G.G.62
TOP: Parallel and Perpendicular Lines

471 ANS: 1 PTS: 2 REF: 081012ge STA: G.G.50
TOP: Tangents KEY: two tangents

472 ANS: 1 PTS: 2 REF: 061009ge STA: G.G.26
TOP: Converse and Biconditional

473 ANS: 3 PTS: 2 REF: 080928ge STA: G.G.50
TOP: Tangents KEY: common tangency

474 ANS: 3



PTS: 2 REF: 061011ge STA: G.G.70 TOP: Quadratic-Linear Systems

475 ANS: 1

After the translation, the coordinates are $A'(-1,5)$ and $B'(3,4)$. After the dilation, the coordinates are $A''(-2,10)$ and $B''(6,8)$.

PTS: 2 REF: fall0823ge STA: G.G.58 TOP: Compositions of Transformations

476 ANS: 1 PTS: 2 REF: 081028ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter

477 ANS: 2

The centroid divides each median into segments whose lengths are in the ratio 2 : 1.

PTS: 2 REF: 060914ge STA: G.G.43 TOP: Centroid

478 ANS: 3

$m = \dfrac{-A}{B} = -\dfrac{3}{4}$

PTS: 2 REF: 011025ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

479 ANS: 4

Corresponding angles of similar triangles are congruent.

PTS: 2 REF: fall0826ge STA: G.G.45 TOP: Similarity
KEY: perimeter and area

480 ANS: 2

$\dfrac{3}{7} = \dfrac{6}{x}$

$3x = 42$

$x = 14$

PTS: 2 REF: 081027ge STA: G.G.46 TOP: Side Splitter Theorem

481 ANS: 3 PTS: 2 REF: 060925ge STA: G.G.17
TOP: Constructions

482 ANS: 2 PTS: 2 REF: 061020ge STA: G.G.19
TOP: Constructions

483 ANS: 4 PTS: 2 REF: 061015ge STA: G.G.56
TOP: Identifying Transformations

484 ANS: 4

$d = \sqrt{(-6-2)^2 + (4-(-5))^2} = \sqrt{64+81} = \sqrt{145}$

PTS: 2 REF: 081013ge STA: G.G.67 TOP: Distance
KEY: general

485 ANS: 2

The slope of $y = \frac{1}{2}x + 5$ is $\frac{1}{2}$. The slope of a perpendicular line is -2. $y = mx + b$.

$5 = (-2)(-2) + b$

$b = 1$

PTS: 2 REF: 060907ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

486 ANS: 3

$\frac{36+20}{2} = 28$

PTS: 2 REF: 061019ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: inside circle

487 ANS: 4

$180 - (50+30) = 100$

PTS: 2 REF: 081006ge STA: G.G.45 TOP: Similarity
KEY: basic

488 ANS: 2 PTS: 2 REF: 061322ge STA: G.G.51
TOP: Arcs Determined by Angles KEY: inscribed

489 ANS: 2 PTS: 2 REF: 011011ge STA: G.G.22
TOP: Locus

490 ANS: 3

The slope of $y = x + 2$ is 1. The slope of $y - x = -1$ is $\frac{-A}{B} = \frac{-(-1)}{1} = 1$.

PTS: 2 REF: 080909ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

491 ANS: 4

sum of interior $\angle$s = sum of exterior $\angle$s

$$(n-2)180 = n\left(180 - \frac{(n-2)180}{n}\right)$$

$$180n - 360 = 180n - 180n + 360$$

$$180n = 720$$

$$n = 4$$

PTS: 2 REF: 081016ge STA: G.G.36 TOP: Interior and Exterior Angles of Polygons

492 ANS: 1
In an equilateral triangle, each interior angle is 60° and each exterior angle is 120° (180° - 120°). The sum of the three interior angles is 180° and the sum of the three exterior angles is 360°.

PTS: 2 REF: 060909ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

493 ANS: 4 PTS: 2 REF: 061008ge STA: G.G.40
TOP: Trapezoids

494 ANS: 1 PTS: 2 REF: 081009ge STA: G.G.73
TOP: Equations of Circles

495 ANS: 1
$d = \sqrt{(-4-2)^2 + (5-(-5))^2} = \sqrt{36+100} = \sqrt{136} = \sqrt{4} \cdot \sqrt{34} = 2\sqrt{34}.$

PTS: 2 REF: 080919ge STA: G.G.67 TOP: Distance
KEY: general

496 ANS: 3 PTS: 2 REF: 060905ge STA: G.G.54
TOP: Reflections KEY: basic

497 ANS: 4 PTS: 2 REF: 060913ge STA: G.G.26
TOP: Conditional Statements

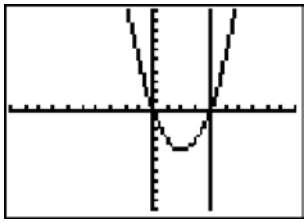
498 ANS: 2
Adjacent sides of a rectangle are perpendicular and have opposite and reciprocal slopes.

PTS: 2 REF: 061028ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

499 ANS: 4
$d = \sqrt{(146-(-4))^2 + (52-2)^2} = \sqrt{25{,}000} \approx 158.1$

PTS: 2 REF: 061021ge STA: G.G.67 TOP: Distance
KEY: general

500 ANS: 1
$y = x^2 - 4x = (4)^2 - 4(4) = 0$. $(4,0)$ is the only intersection.



PTS: 2 REF: 060923ge STA: G.G.70 TOP: Quadratic-Linear Systems

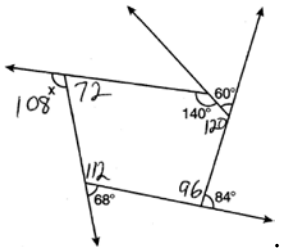
501 ANS: 4
$L = 2\pi rh = 2\pi \cdot 5 \cdot 11 \approx 345.6$

PTS: 2 REF: 061006ge STA: G.G.14 TOP: Volume and Lateral Area

502 ANS: 2
Because the triangles are similar, $\frac{\text{m}\angle A}{\text{m}\angle D} = 1$

PTS: 2 REF: 011022ge STA: G.G.45 TOP: Similarity
KEY: perimeter and area

503 ANS: 3



. The sum of the interior angles of a pentagon is $(5-2)180 = 540$.

PTS: 2 REF: 011023ge STA: G.G.36 TOP: Interior and Exterior Angles of Polygons

504 ANS: 3 PTS: 2 REF: 060928ge STA: G.G.8
TOP: Planes

505 ANS: 4

$\triangle ABC \sim \triangle DBE$. $\dfrac{\overline{AB}}{\overline{DB}} = \dfrac{\overline{AC}}{\overline{DE}}$

$\dfrac{9}{2} = \dfrac{x}{3}$

$x = 13.5$

PTS: 2 REF: 060927ge STA: G.G.46 TOP: Side Splitter Theorem

506 ANS: 2 PTS: 2 REF: 060910ge STA: G.G.71
TOP: Equations of Circles

507 ANS: 4 PTS: 2 REF: 011012ge STA: G.G.1
TOP: Planes

508 ANS: 4

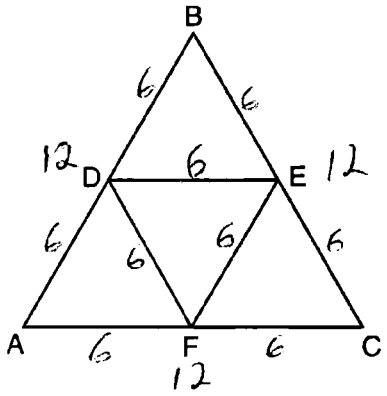
The slope of a line in standard form is $-\dfrac{A}{B}$, so the slope of this line is $\dfrac{-4}{2} = -2$. A parallel line would also have a slope of –2. Since the answers are in slope intercept form, find the *y*-intercept: $y = mx + b$

$3 = -2(7) + b$

$17 = b$

PTS: 2 REF: 081010ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

509 ANS: 1



PTS: 2 REF: 081003ge STA: G.G.42 TOP: Midsegments

510 ANS: 4 PTS: 2 REF: 080905ge STA: G.G.29
TOP: Triangle Congruency

511 ANS: 1 PTS: 2 REF: 081008ge STA: G.G.3
TOP: Planes

512 ANS: 3 PTS: 2 REF: 081002ge STA: G.G.9
TOP: Planes

513 ANS: 1 PTS: 2 REF: 060903ge STA: G.G.56
TOP: Identifying Transformations

514 ANS: 2

$$\frac{140 - \overline{RS}}{2} = 40$$

$$140 - \overline{RS} = 80$$

$$\overline{RS} = 60$$

PTS: 2 REF: 081025ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: outside circle

515 ANS: 2

$7 + 18 > 6 + 12$

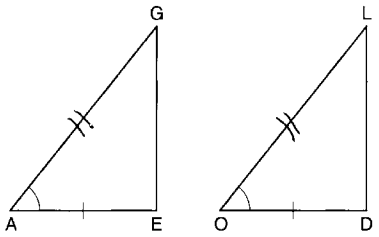
PTS: 2 REF: fall0819ge STA: G.G.33 TOP: Triangle Inequality Theorem

516 ANS: 1 PTS: 2 REF: 080918ge STA: G.G.41
TOP: Special Quadrilaterals

517 ANS: 4 PTS: 2 REF: 060904ge STA: G.G.13
TOP: Solids

518 ANS: 3 PTS: 2 REF: 081026ge STA: G.G.26
TOP: Contrapositive

519 ANS: 2



PTS: 2 REF: 081007ge STA: G.G.28 TOP: Triangle Congruency

520 ANS: 3 PTS: 2 REF: 080902ge STA: G.G.17
TOP: Constructions

521 ANS: 2
Longest side of a triangle is opposite the largest angle. Shortest side is opposite the smallest angle.

PTS: 2 REF: 060911ge STA: G.G.34 TOP: Angle Side Relationship

522 ANS: 1
$A'(2,4)$

PTS: 2 REF: 011023ge STA: G.G.54 TOP: Compositions of Transformations
KEY: basic

523 ANS: 2 PTS: 2 REF: 011004ge STA: G.G.17
TOP: Constructions

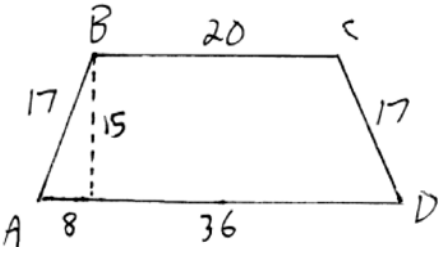
524 ANS: 1 PTS: 2 REF: 011024ge STA: G.G.3
TOP: Planes

525 ANS: 4

$(n-2)180 = (8-2)180 = 1080.\ \frac{1080}{8} = 135.$

PTS: 2 REF: fall0827ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

526 ANS: 3



$\frac{36-20}{2} = 8.\ \sqrt{17^2 - 8^2} = 15$

PTS: 2 REF: 061016ge STA: G.G.40 TOP: Trapezoids

527 ANS: 2

$M_x = \frac{2+(-4)}{2} = -1.\ M_Y = \frac{-3+6}{2} = \frac{3}{2}.$

PTS: 2 REF: fall0813ge STA: G.G.66 TOP: Midpoint
KEY: general

528 ANS: 4

$\overline{BG}$ is also an angle bisector since it intersects the concurrence of $\overline{CD}$ and $\overline{AE}$

PTS: 2 REF: 061025ge STA: G.G.21
KEY: Centroid, Orthocenter, Incenter and Circumcenter

529 ANS: 4 PTS: 2 REF: fall0802ge STA: G.G.24
TOP: Negations

530 ANS: 3

Because $\overline{OC}$ is a radius, its length is 5. Since $CE = 2$ $OE = 3$. $\triangle EDO$ is a 3-4-5 triangle. If $ED = 4$, $BD = 8$.

PTS: 2 REF: fall0811ge STA: G.G.49 TOP: Chords

531 ANS: 1

$$\frac{3x^2 + 18x + 24}{3(x+2)}$$

$$\frac{3(x^2 + 6x + 8)}{3(x+2)}$$

$$\frac{3(x+4)(x+2)}{3(x+2)}$$

$$x + 4$$

PTS: 2 REF: fall0815ge STA: G.G.12 TOP: Volume

532 ANS: 1

$\angle DCB$ and $\angle ADC$ are supplementary adjacent angles of a parallelogram. $180 - 120 = 60$. $\angle 2 = 60 - 45 = 15$.

PTS: 2 REF: 080907ge STA: G.G.38 TOP: Parallelograms

533 ANS: 2

A dilation affects distance, not angle measure.

PTS: 2 REF: 080906ge STA: G.G.60 TOP: Identifying Transformations

534 ANS: 2

$6 + 17 > 22$

PTS: 2 REF: 080916ge STA: G.G.33 TOP: Triangle Inequality Theorem

535 ANS: 4 PTS: 2 REF: 060912ge STA: G.G.23
TOP: Locus

536 ANS: 4 PTS: 2 REF: 011019ge STA: G.G.44
TOP: Similarity Proofs

537 ANS: 1

$V = \pi r^2 h$

$1000 = \pi r^2 \cdot 8$

$r^2 = \frac{1000}{8\pi}$

$r \approx 6.3$

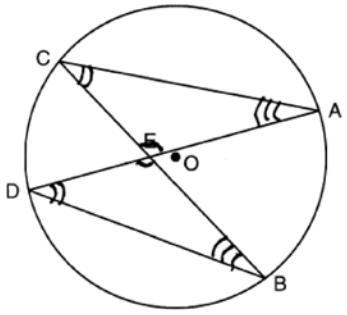
PTS: 2 REF: 080926ge STA: G.G.14 TOP: Volume and Lateral Area

538 ANS: 4

The marked 60º angle and the angle above it are on the same straight line and supplementary. This unmarked supplementary angle is 120º. Because the unmarked 120º angle and the marked 120º angle are alternate exterior angles and congruent, $d \parallel e$.

PTS: 2 REF: 080901ge STA: G.G.35 TOP: Parallel Lines and Transversals

539 ANS: 2



PTS: 2 REF: 061026ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: inscribed

540 ANS: 1

$\overline{AB} = 10$ since $\triangle ABC$ is a 6-8-10 triangle. $6^2 = 10x$

$3.6 = x$

PTS: 2 REF: 060915ge STA: G.G.47 TOP: Similarity
KEY: leg

541 ANS: 1

$V = \frac{1}{3}\pi r^2 h = \frac{1}{3}\pi \cdot 4^2 \cdot 12 \approx 201$

PTS: 2 REF: 060921ge STA: G.G.15 TOP: Volume

542 ANS: 4 PTS: 2 REF: 080925ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter

543 ANS: 4

$x^2 = (4+5) \times 4$

$x^2 = 36$

$x = 6$

PTS: 2 REF: 011008ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: tangent and secant

544 ANS: 2

$x^2 = 3(x+18)$

$x^2 - 3x - 54 = 0$

$(x-9)(x+6) = 0$

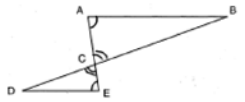
$x = 9$

PTS: 2 REF: fall0817ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: tangent and secant

545 ANS: 3 PTS: 2 REF: 080924ge STA: G.G.24
TOP: Negations

546 ANS: 3 PTS: 2 REF: 080913ge STA: G.G.28
TOP: Triangle Congruency

547 ANS: 2

$\angle ACB$ and $\angle ECD$ are congruent vertical angles and $\angle CAB \cong \angle CED$. 

PTS: 2 REF: 060917ge STA: G.G.44 TOP: Similarity Proofs

548 ANS: 1

Opposite sides of a parallelogram are congruent. $4x - 3 = x + 3$. $SV = (2) + 3 = 5$.

$3x = 6$

$x = 2$

PTS: 2 REF: 011013ge STA: G.G.38 TOP: Parallelograms

549 ANS: 2 PTS: 2 REF: 011020ge STA: G.G.74
TOP: Graphing Circles

550 ANS: 3

The lateral edges of a prism are parallel.

PTS: 2 REF: fall0808ge STA: G.G.10 TOP: Solids

551 ANS: 1

$M_x = \frac{-2+6}{2} = 2$. $M_y = \frac{3+3}{2} = 3$. The center is $(2,3)$. $d = \sqrt{(-2-6)^2 + (3-3)^2} = \sqrt{64+0} = 8$. If the diameter is 8, the radius is 4 and $r^2 = 16$.

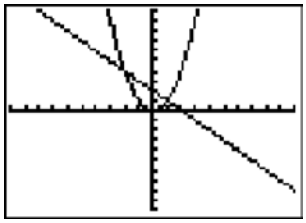
PTS: 2 REF: fall0820ge STA: G.G.71 TOP: Equations of Circles

552 ANS: 4

Longest side of a triangle is opposite the largest angle. Shortest side is opposite the smallest angle.

PTS: 2 REF: 081011ge STA: G.G.34 TOP: Angle Side Relationship

553 ANS: 3



PTS: 2 REF: fall0805ge STA: G.G.70 TOP: Quadratic-Linear Systems

554 ANS: 2

$$x^2 + (x+7)^2 = 13^2$$

$$x^2 + x^2 + 7x + 7x + 49 = 169$$

$$2x^2 + 14x - 120 = 0$$

$$x^2 + 7x - 60 = 0$$

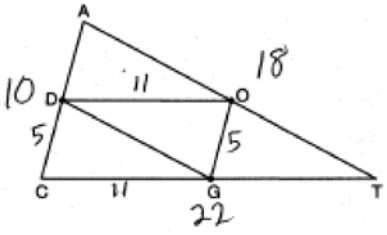
$$(x+12)(x-5) = 0$$

$$x = 5$$

$$2x = 10$$

PTS: 2 REF: 061024ge STA: G.G.48 TOP: Pythagorean Theorem

555 ANS: 3



PTS: 2 REF: 080920ge STA: G.G.42 TOP: Midsegments

556 ANS: 2

$M_x = \dfrac{3x+5+x-1}{2} = \dfrac{4x+4}{2} = 2x+2.$ $M_Y = \dfrac{3y+(-y)}{2} = \dfrac{2y}{2} = y.$

PTS: 2 REF: 081019ge STA: G.G.66 TOP: Midpoint
KEY: general

557 ANS: 4 PTS: 2 REF: 061003ge STA: G.G.10
TOP: Solids

558 ANS: 1 PTS: 2 REF: 061012ge STA: G.G.20
TOP: Constructions

559 ANS: 4
Median $\overline{BF}$ bisects $\overline{AC}$ so that $\overline{CF} \cong \overline{FA}$.

PTS: 2 REF: fall0810ge STA: G.G.24 TOP: Statements
560 ANS: 4 PTS: 2 REF: 081005ge STA: G.G.18
TOP: Constructions
561 ANS: 3 PTS: 2 REF: fall0825ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter
562 ANS: 2
$\frac{87+35}{2} = \frac{122}{2} = 61$

PTS: 2 REF: 011015ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: inside circle
563 ANS: 4
Let $\overline{AD} = x$. $36x = 12^2$

$x = 4$

PTS: 2 REF: 080922ge STA: G.G.47 TOP: Similarity
KEY: leg
564 ANS: 2
$(d+4)4 = 12(6)$

$4d + 16 = 72$

$d = 14$

$r = 7$

PTS: 2 REF: 061023ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two secants
565 ANS: 4
$d = \sqrt{(-3-1)^2 + (2-0)^2} = \sqrt{16+4} = \sqrt{20} = \sqrt{4} \cdot \sqrt{5} = 2\sqrt{5}$

PTS: 2 REF: 011017ge STA: G.G.67 TOP: Distance
KEY: general
566 ANS: 1 PTS: 2 REF: 060918ge STA: G.G.2
TOP: Planes
567 ANS: 3 PTS: 2 REF: 061004ge STA: G.G.31
TOP: Isosceles Triangle Theorem
568 ANS: 3 PTS: 2 REF: 011028ge STA: G.G.26
TOP: Conditional Statements
569 ANS: 1
$\angle A = \frac{(n-2)180}{n} = \frac{(5-2)180}{5} = 108$ $\angle AEB = \frac{180-108}{2} = 36$

PTS: 2 REF: 081022ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

570 ANS: 2

$y + \frac{1}{2}x = 4 \quad 3x + 6y = 12$

$6y = -3x + 12$

$y = -\frac{1}{2}x + 4$

$y = -\frac{3}{6}x + 2$

$m = -\frac{1}{2}$

$y = -\frac{1}{2}x + 2$

PTS: 2 REF: 081014ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

571 ANS: 3 PTS: 2 REF: 011010ge STA: G.G.71
TOP: Equations of Circles

572 ANS: 2

The slope of a line in standard form is $-\frac{A}{B}$, so the slope of this line is $\frac{-2}{-1} = 2$. A parallel line would also have a slope of 2. Since the answers are in slope intercept form, find the *y*-intercept: $y = mx + b$

$-11 = 2(-3) + b$

$-5 = b$

PTS: 2 REF: fall0812ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

573 ANS: 1

$(x, y) \rightarrow (x + 3, y + 1)$

PTS: 2 REF: fall0803ge STA: G.G.54 TOP: Translations

574 ANS: 4 PTS: 2 REF: 011009ge STA: G.G.19
TOP: Constructions

575 ANS: 3 PTS: 2 REF: fall0814ge STA: G.G.73
TOP: Equations of Circles

576 ANS: 3

$m = \frac{-A}{B} = \frac{5}{2}$. $m = \frac{-A}{B} = \frac{10}{4} = \frac{5}{2}$

PTS: 2 REF: 011014ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

577 ANS: 2

Parallel chords intercept congruent arcs. $\text{m}\overset{\frown}{AD} = \text{m}\overset{\frown}{BC} = 60$. $\text{m}\angle CDB = \frac{1}{2}\text{m}\overset{\frown}{BC} = 30$.

PTS: 2 REF: 060906ge STA: G.G.52 TOP: Chords and Secants

578 ANS: 4

The radius is 4. $r^2 = 16$.

PTS: 2 REF: 061014ge STA: G.G.72 TOP: Equations of Circles

579 ANS: 2

Parallel chords intercept congruent arcs. $m\overset{\frown}{AC} = m\overset{\frown}{BD} = 30$. $180 - 30 - 30 = 120$.

PTS: 2 REF: 080904ge STA: G.G.52 TOP: Chords and Secants

580 ANS: 2

The slope of a line in standard form is $-\frac{A}{B}$ so the slope of this line is $-\frac{5}{3}$ Perpendicular lines have slope that are the opposite and reciprocal of each other.

PTS: 2 REF: fall0828ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

581 ANS: 4 PTS: 2 REF: 060922ge STA: G.G.73
TOP: Equations of Circles

582 ANS: 4 PTS: 2 REF: 061018ge STA: G.G.56
TOP: Identifying Transformations

583 ANS: 3 PTS: 2 REF: 061017ge STA: G.G.1
TOP: Planes

584 ANS: 1

$\triangle PRT$ and $\triangle SRQ$ share $\angle R$ and it is given that $\angle RPT \cong \angle RSQ$.

PTS: 2 REF: fall0821ge STA: G.G.44 TOP: Similarity Proofs

585 ANS: 2

$4(4x - 3) = 3(2x + 8)$

$16x - 12 = 6x + 24$

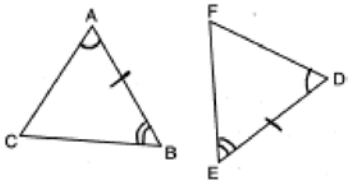
$10x = 36$

$x = 3.6$

PTS: 2 REF: 080923ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two chords

586 ANS: 3 PTS: 2 REF: fall0804ge STA: G.G.18
TOP: Constructions

587 ANS: 3

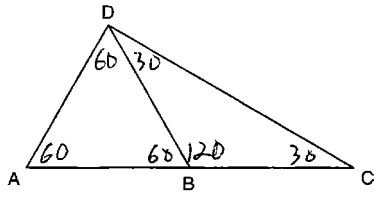


PTS: 2 REF: 060902ge STA: G.G.28 TOP: Triangle Congruency

588 ANS: 4 PTS: 2 REF: fall0818ge STA: G.G.61
TOP: Analytical Representations of Transformations

Geometry 2 Point Regents Exam Questions
Answer Section

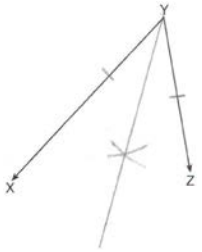
589 ANS:



30.

PTS: 2 REF: 011129ge STA: G.G.31 TOP: Isosceles Triangle Theorem

590 ANS:



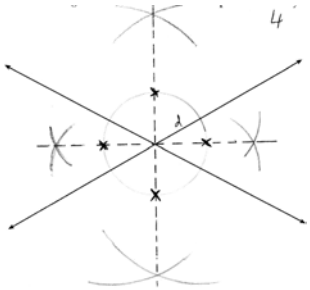
PTS: 2 REF: 011233ge STA: G.G.17 TOP: Constructions

591 ANS:

$$\frac{(n-2)180}{n} = \frac{(10-2)180}{10} = 144$$

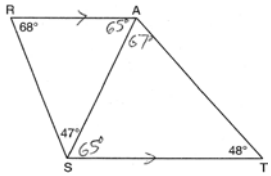
PTS: 2 REF: 011531ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

592 ANS:



PTS: 2 REF: 081334ge STA: G.G.22 TOP: Locus

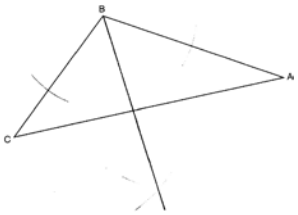
593 ANS:



$\overline{ST}$

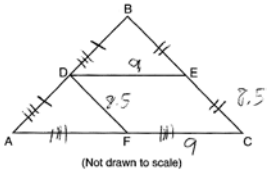
PTS: 2 REF: 061430ge STA: G.G.34 TOP: Angle Side Relationship

594 ANS:



PTS: 2 REF: 061232ge STA: G.G.17 TOP: Constructions

595 ANS:



$8.5 + 9 + 8.5 + 9 = 35$

PTS: 2 REF: 081430ge STA: G.G.42 TOP: Midsegments

596 ANS:

452. $SA = 4\pi r^2 = 4\pi \cdot 6^2 = 144\pi \approx 452$

PTS: 2 REF: 061029ge STA: G.G.16 TOP: Volume and Surface Area

597 ANS:

$m = \frac{3}{2}; m_{\perp} = -\frac{2}{3}$ $y = -\frac{2}{3}x$

PTS: 2 REF: 081533ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

598 ANS:

$(x-5)^2 + (y+4)^2 = 36$

PTS: 2 REF: 081132ge STA: G.G.72 TOP: Equations of Circles

599 ANS:

The slope of $y = 2x + 3$ is 2. The slope of $2y + x = 6$ is $\frac{-A}{B} = \frac{-1}{2}$. Since the slopes are opposite reciprocals, the lines are perpendicular.

PTS: 2 REF: 011231ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

600 ANS:

$Bh = V$

$12h = 84$

$h = 7$

PTS: 2 REF: 011432ge STA: G.G.12 TOP: Volume

601 ANS:

$\left(\frac{3}{2}\right)^2 = \frac{27}{A}$

$\frac{9}{4} = \frac{27}{A}$

$9A = 108$

$A = 12$

PTS: 2 REF: 061434ge STA: G.G.45 TOP: Similarity
KEY: perimeter and area

602 ANS:

$A = 2B - 15$. $2B - 15 + B + 2B - 15 + B = 180$

$C = A + B$ $6B - 30 = 180$

$C = 2B - 15 + B$ $6B = 210$

$B = 35$

PTS: 2 REF: 081332ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

603 ANS:

center: $(3, -4)$; radius: $\sqrt{10}$

PTS: 2 REF: 081333ge STA: G.G.73 TOP: Equations of Circles

604 ANS:

$(2a - 3, 3b + 2)$. $\left(\frac{3a + a - 6}{2}, \frac{2b - 1 + 4b + 5}{2}\right) = \left(\frac{4a - 6}{2}, \frac{6b + 4}{2}\right) = (2a - 3, 3b + 2)$

PTS: 2 REF: 061134ge STA: G.G.66 TOP: Midpoint

605 ANS:

$A'(2,2), B'(3,0), C(1,-1)$

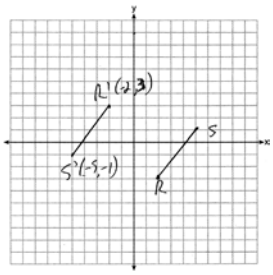
PTS: 2 REF: 081329ge STA: G.G.58 TOP: Dilations

606 ANS:

$\overline{BE}$ and $\overline{AD}$ intersect at point C, $\overline{BC} \cong \overline{EC}$, $\overline{AC} \cong \overline{DC}$, $\overline{AB}$ and $\overline{DE}$ are drawn (Given). $\angle BCA \cong \angle ECD$ (Vertical Angles). $\triangle ABC \cong \triangle DEC$ (SAS).

PTS: 2 REF: 011529ge STA: G.G.27 TOP: Triangle Proofs

607 ANS:



PTS: 2 REF: 081529ge STA: G.G.54 TOP: Reflections
KEY: grids

608 ANS:

$\frac{180-80}{2} = 50$

PTS: 2 REF: 081129ge STA: G.G.52 TOP: Chords and Secants

609 ANS:

Contrapositive-If two angles of a triangle are not congruent, the sides opposite those angles are not congruent.

PTS: 2 REF: fall0834ge STA: G.G.26 TOP: Conditional Statements

610 ANS:

9.1. $(11)(8)h = 800$

$h \approx 9.1$

PTS: 2 REF: 061131ge STA: G.G.12 TOP: Volume

611 ANS:

20. $5x + 10 = 4x + 30$

$x = 20$

PTS: 2 REF: 060934ge STA: G.G.45 TOP: Similarity
KEY: basic

612 ANS:

$5 \cdot 5 = 10w$

$25 = 10w$

$2.5 = w$

PTS: 2 REF: 061432ge STA: G.G.11 TOP: Volume

613 ANS:

70. $3x + 5 + 3x + 5 + 2x + 2x = 180$

$10x + 10 = 360$

$10x = 350$

$x = 35$

$2x = 70$

PTS: 2 REF: 081029ge STA: G.G.40 TOP: Trapezoids

614 ANS:

$24 \cdot 6 = w \cdot 8$

$144 = 8w$

$18 = w$

PTS: 2 REF: 011533ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two secants

615 ANS:

67. $\frac{180 - 46}{2} = 67$

PTS: 2 REF: 011029ge STA: G.G.31 TOP: Isosceles Triangle Theorem

616 ANS:

26. $x + 3x + 5x - 54 = 180$

$9x = 234$

$x = 26$

PTS: 2 REF: 080933ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

617 ANS:

$\sqrt{(3-7)^2 + (-4-2)^2} = \sqrt{16+36} = \sqrt{52} = \sqrt{4}\sqrt{13} = 2\sqrt{13}.$

PTS: 2 REF: 011431ge STA: G.G.67 TOP: Distance

618 ANS:

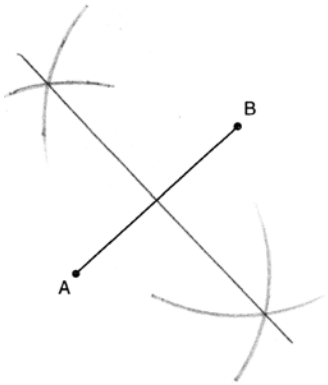
16.7. $\frac{x}{25} = \frac{12}{18}$

$18x = 300$

$x \approx 16.7$

PTS: 2 REF: 061133ge STA: G.G.46 TOP: Side Splitter Theorem

619 ANS:



PTS: 2 REF: 011430ge STA: G.G.18 TOP: Constructions

620 ANS:

$\sqrt{(6-3)^2+(-1-8)^2} = \sqrt{9+81} = \sqrt{90} = \sqrt{9}\sqrt{10} = 3\sqrt{10}.$

PTS: 2 REF: 061533ge STA: G.G.67 TOP: Distance

621 ANS:

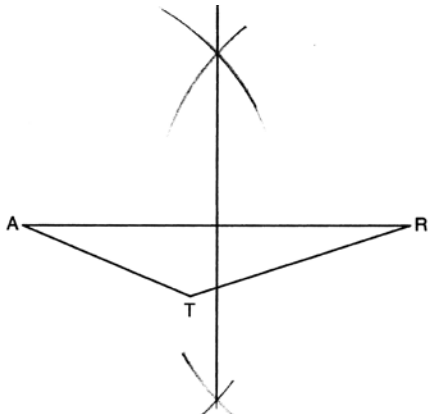
$y = -2x + 14$. The slope of $2x + y = 3$ is $\frac{-A}{B} = \frac{-2}{1} = -2$. $y = mx + b$.

$4 = (-2)(5) + b$

$b = 14$

PTS: 2 REF: 060931ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

622 ANS:



PTS: 2 REF: 011530ge STA: G.G.18 TOP: Constructions

623 ANS:

18. $V = \frac{1}{3}Bh = \frac{1}{3}lwh$

$288 = \frac{1}{3} \cdot 8 \cdot 6 \cdot h$

$288 = 16h$

$18 = h$

PTS: 2 REF: 061034ge STA: G.G.13 TOP: Volume

624 ANS:

2 is not a prime number, false.

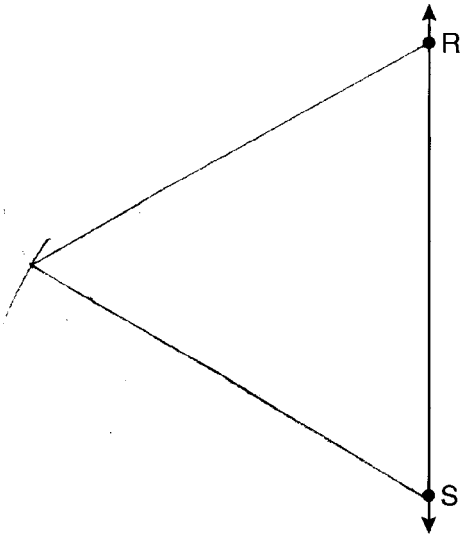
PTS: 2 REF: 081229ge STA: G.G.24 TOP: Negations

625 ANS:

$EO = 6.\ CE = \sqrt{10^2 - 6^2} = 8$

PTS: 2 REF: 011234ge STA: G.G.49 TOP: Chords

626 ANS:



PTS: 2 REF: 061130ge STA: G.G.20 TOP: Constructions

627 ANS:

$\sqrt{(-4-2)^2 + (3-5)^2} = \sqrt{36+4} = \sqrt{40} = \sqrt{4}\sqrt{10} = 2\sqrt{10}.$

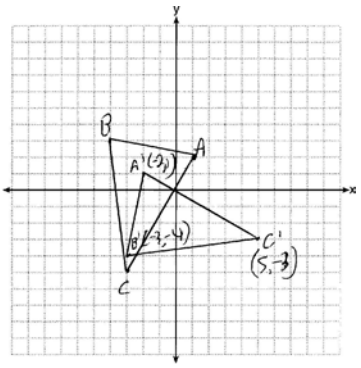
PTS: 2 REF: 081232ge STA: G.G.67 TOP: Distance

628 ANS:

$l = \sqrt{12^2 + 5^2} = \sqrt{169} = 13\ \ L = \pi r l = \pi(5)(13) = 65\pi$

PTS: 2 REF: 061531ge STA: G.G.15 TOP: Volume and Lateral Area

629 ANS:



$A'(-2,1)$, $B'(-3,-4)$, and $C'(5,-3)$

PTS: 2 REF: 081230ge STA: G.G.54 TOP: Rotations

630 ANS:

375π $L = \pi r l = \pi(15)(25) = 375\pi$

PTS: 2 REF: 081030ge STA: G.G.15 TOP: Lateral Area

631 ANS:

$R'(-3,-2)$, $S'(-4,4)$, and $T'(2,2)$.

PTS: 2 REF: 011232ge STA: G.G.54 TOP: Rotations

632 ANS:

The medians of a triangle are not concurrent. False.

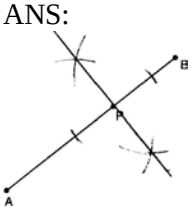
PTS: 2 REF: 061129ge STA: G.G.24 TOP: Negations

633 ANS:

$(x+1)^2 + (y-2)^2 = 36$

PTS: 2 REF: 081034ge STA: G.G.72 TOP: Equations of Circles

634 ANS:



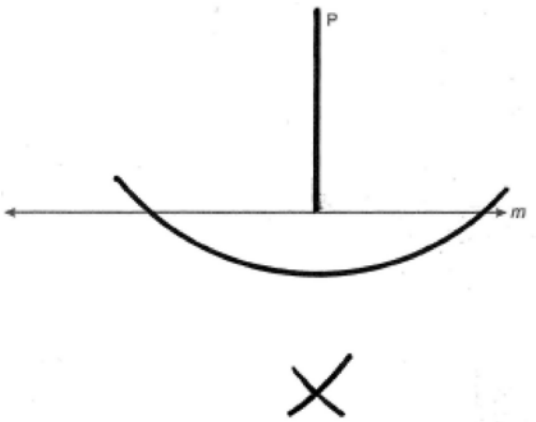
PTS: 2 REF: 081233ge STA: G.G.19 TOP: Constructions

635 ANS:

The slope of $x + 2y = 4$ is $m = \frac{-A}{B} = \frac{-1}{2}$. The slope of $4y - 2x = 12$ is $\frac{-A}{B} = \frac{2}{4} = \frac{1}{2}$. Since the slopes are neither equal nor opposite reciprocals, the lines are neither parallel nor perpendicular.

PTS: 2 REF: 061231ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

636 ANS:



PTS: 2 REF: 060930ge STA: G.G.19 TOP: Constructions

637 ANS:

4. $l_1 w_1 h_1 = l_2 w_2 h_2$

$10 \times 2 \times h = 5 \times w_2 \times h$

$20 = 5w_2$

$w_2 = 4$

PTS: 2 REF: 011030ge STA: G.G.11 TOP: Volume

638 ANS:

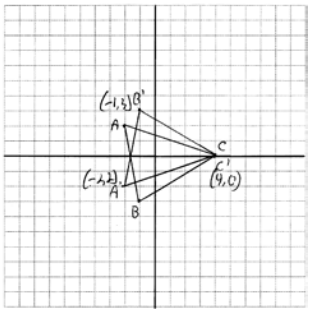
$(x, y) \rightarrow (-y, x)$

$B(5, 1) \rightarrow B'(-1, 5)$

$C(-3, -2) \rightarrow C'(2, -3)$

PTS: 2 REF: 061429ge STA: G.G.54 TOP: Rotations

639 ANS:



PTS: 2 REF: 011130ge STA: G.G.54 TOP: Reflections
KEY: grids

640 ANS:

$5x = 2(x + 12)$ $QM = 5(8) + (8) + 12 = 60$

$5x = 2x + 24$

$3x = 24$

$x = 8$

PTS: 2 REF: 081433ge STA: G.G.43 TOP: Centroid

641 ANS:

Neither. The slope of $y = \frac{1}{2}x - 1$ is $\frac{1}{2}$. The slope of $y + 4 = -\frac{1}{2}(x - 2)$ is $-\frac{1}{2}$. The slopes are neither the same nor opposite reciprocals.

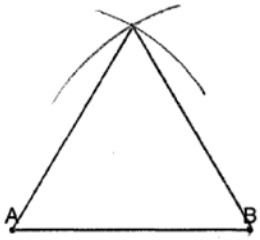
PTS: 2 REF: 011433ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

642 ANS:

2016. $V = \frac{1}{3}Bh = \frac{1}{3}s^2h = \frac{1}{3}12^2 \cdot 42 = 2016$

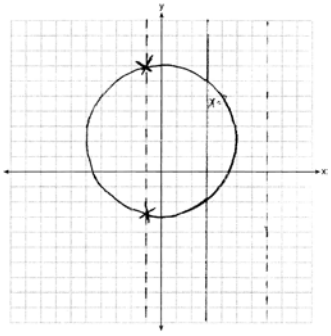
PTS: 2 REF: 080930ge STA: G.G.13 TOP: Volume

643 ANS:



PTS: 2 REF: 011032ge STA: G.G.20 TOP: Constructions

644 ANS:



PTS: 2 REF: 061234ge STA: G.G.23 TOP: Locus

645 ANS:

6. The centroid divides each median into segments whose lengths are in the ratio 2 : 1. $\overline{TD} = 6$ and $\overline{DB} = 3$

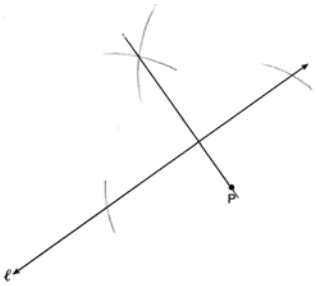
PTS: 2 REF: 011034ge STA: G.G.43 TOP: Centroid

646 ANS:

If $r = 5$, then $r^2 = 25$. $(x+3)^2 + (y-2)^2 = 25$

PTS: 2 REF: 011332ge STA: G.G.71 TOP: Equations of Circles

647 ANS:



PTS: 2 REF: 011333ge STA: G.G.19 TOP: Constructions

648 ANS:

37. Since $\overline{DE}$ is a midsegment, $AC = 14$. $10 + 13 + 14 = 37$

PTS: 2 REF: 061030ge STA: G.G.42 TOP: Midsegments

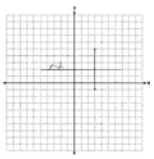
649 ANS:

$L = 2\pi rh = 2\pi \cdot 12 \cdot 22 \approx 1659$. $\frac{1659}{600} \approx 2.8$. 3 cans are needed.

PTS: 2 REF: 061233ge STA: G.G.14 TOP: Volume and Lateral Area

650 ANS:

$M = \left(\frac{3+3}{2}, \frac{-1+5}{2}\right) = (3,2)$. $y = 2$.



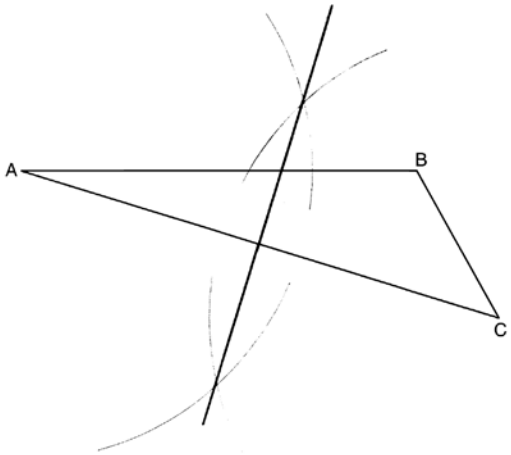
PTS: 2 REF: 011334ge STA: G.G.68 TOP: Perpendicular Bisector

651 ANS:

$m = \frac{-A}{B} = \frac{6}{2} = 3$. $m_{\perp} = -\frac{1}{3}$.

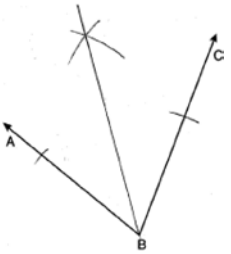
PTS: 2 REF: 011134ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

652 ANS:



PTS: 2 REF: 081130ge STA: G.G.18 TOP: Constructions

653 ANS:



PTS: 2 REF: 080932ge STA: G.G.17 TOP: Constructions

654 ANS:

$V = \pi r^2 h = \pi(5)^2 \cdot 7 = 175\pi$

PTS: 2 REF: 081231ge STA: G.G.14 TOP: Volume and Lateral Area

655 ANS:

$86° \cdot 2 = 172°$ $180° - 86° = 94°$

PTS: 2 REF: 081432ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: inscribed

656 ANS:

$2\sqrt{3}$. $x^2 = 3 \cdot 4$

$x = \sqrt{12} = 2\sqrt{3}$

PTS: 2 REF: fall0829ge STA: G.G.47 TOP: Similarity
KEY: altitude

657 ANS:

$\overline{AC}$. $m\angle BCA = 63$ and $m\angle ABC = 80$. $\overline{AC}$ is the longest side as it is opposite the largest angle.

PTS: 2 REF: 080934ge STA: G.G.34 TOP: Angle Side Relationship

658 ANS:

$x^2 = 9 \cdot 8$

$x = \sqrt{72}$

$x = \sqrt{36}\sqrt{2}$

$x = 6\sqrt{2}$

PTS: 2 REF: 011132ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two chords

659 ANS:

25. $d = \sqrt{(-3-4)^2 + (1-25)^2} = \sqrt{49+576} = \sqrt{625} = 25.$

PTS: 2 REF: fall0831ge STA: G.G.67 TOP: Distance
KEY: general

660 ANS:

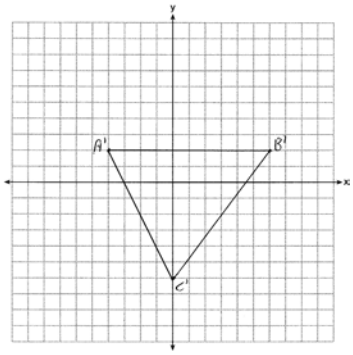
$(n-2)180 = 540.\ \frac{540}{5} = 108$

$n - 2 = 3$

$n = 5$

PTS: 2 REF: 081434ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

661 ANS:



PTS: 2 REF: 081429ge STA: G.G.58 TOP: Dilations

662 ANS:

$L = 2\pi rh = 2\pi \cdot 3 \cdot 7 = 42\pi$

PTS: 2 REF: 061329ge STA: G.G.14 TOP: Volume and Lateral Area

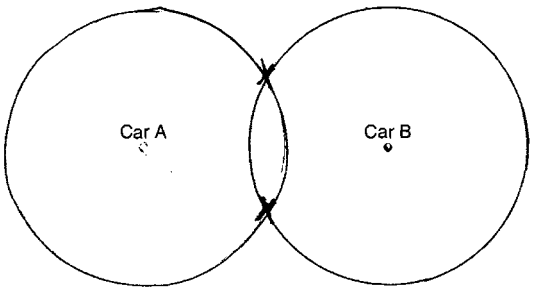
663 ANS:

$\left(\frac{0+1}{2}, \frac{4+-4}{2}\right)$

$\left(\frac{1}{2}, 0\right)$

PTS: 2 REF: 081534ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

664 ANS:



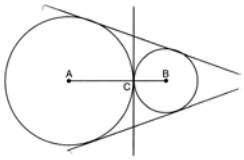
PTS: 2 REF: 081033ge STA: G.G.22 TOP: Locus

665 ANS:

$\sqrt{(7-3)^2+(-8-0)^2} = \sqrt{16+64} = \sqrt{80} = 4\sqrt{5}$

PTS: 2 REF: 061331ge STA: G.G.69 TOP: Triangles in the Coordinate Plane

666 ANS:



PTS: 2 REF: 011330ge STA: G.G.50 TOP: Tangents
KEY: common tangency

667 ANS:

$2x+7=25 \quad NT=4.5$

$2x=18$

$x=9$

PTS: 2 REF: 081531ge STA: G.G.42 TOP: Midsegments

668 ANS:

$x^2=8(10+8)$

$x^2=144$

$x=12$

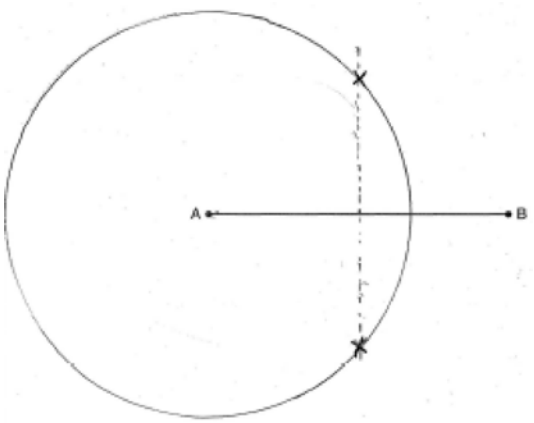
PTS: 2 REF: 061431ge STA: G.G.47 TOP: Similarity
KEY: leg

669 ANS:

$m_{\overline{AB}}=\frac{4-1}{4-2}=\frac{3}{2}. \; m_{\overline{BC}}=-\frac{2}{3}$

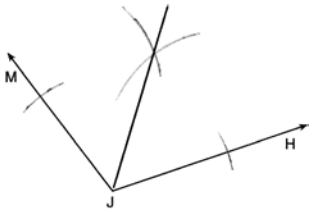
PTS: 4 REF: 061334ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

670 ANS:



PTS: 2 REF: 060932ge STA: G.G.22 TOP: Locus

671 ANS:



PTS: 2 REF: 081330ge STA: G.G.17 TOP: Constructions

672 ANS:

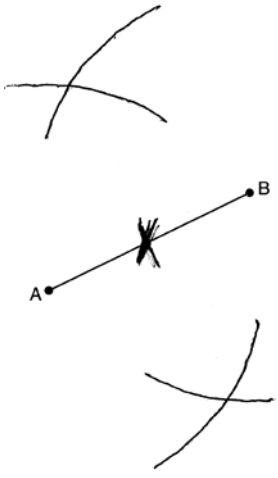
$m = \frac{1}{3}$ $4 = \frac{1}{3}(-3) + b$ $y = \frac{1}{3}x + 5$

$4 = -1 + b$

$5 = b$

PTS: 2 REF: 011532ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

673 ANS:



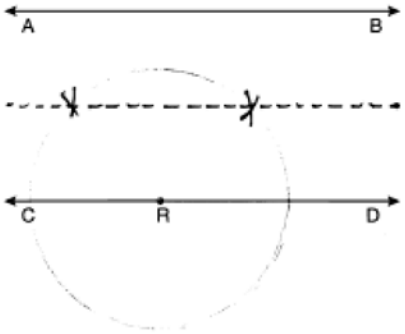
PTS: 2 REF: 061532ge STA: G.G.18 TOP: Constructions

674 ANS:

$V = \frac{4}{3}\pi \cdot 9^3 = 972\pi$

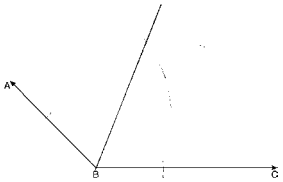
PTS: 2 REF: 081131ge STA: G.G.16 TOP: Volume and Surface Area

675 ANS:



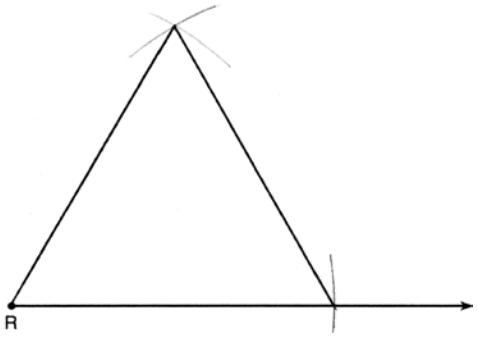
PTS: 2 REF: 061033ge STA: G.G.22 TOP: Locus

676 ANS:



PTS: 2 REF: 011133ge STA: G.G.17 TOP: Constructions

677 ANS:



PTS: 2 REF: 061332ge STA: G.G.20 TOP: Constructions

678 ANS:

$\angle ACB \cong \angle AED$ is given. $\angle A \cong \angle A$ because of the reflexive property. Therefore $\triangle ABC \sim \triangle ADE$ because of AA.

PTS: 2 REF: 081133ge STA: G.G.44 TOP: Similarity Proofs

679 ANS:

5. $\frac{3}{x} = \frac{6+3}{15}$

$9x = 45$

$x = 5$

PTS: 2 REF: 011033ge STA: G.G.46 TOP: Side Splitter Theorem

680 ANS:

$2x - 20 = x + 20$. $\text{m}\overset{\frown}{AB} = x + 20 = 40 + 20 = 60$

$x = 40$

PTS: 2 REF: 011229ge STA: G.G.52 TOP: Chords and Secants

681 ANS:

$\sqrt{(-1-3)^2 + (4-(-2))^2} = \sqrt{16+36} = \sqrt{52} = \sqrt{4}\sqrt{13} = 2\sqrt{13}$

PTS: 2 REF: 081331ge STA: G.G.67 TOP: Distance

682 ANS:

34. $2x - 12 + x + 90 = 180$

$3x + 78 = 90$

$3x = 102$

$x = 34$

PTS: 2 REF: 061031ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

683 ANS:

22.4. $V = \pi r^2 h$

$12566.4 = \pi r^2 \cdot 8$

$r^2 = \frac{12566.4}{8\pi}$

$r \approx 22.4$

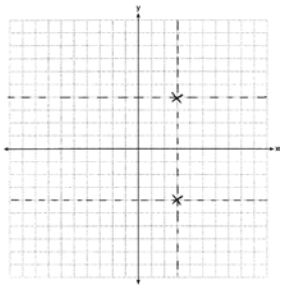
PTS: 2 REF: fall0833ge STA: G.G.14 TOP: Volume and Lateral Area

684 ANS:

$T_{-2,1}$ $A(0,1)$

PTS: 2 REF: 081431ge STA: G.G.54 TOP: Translations

685 ANS:



PTS: 2 REF: 061333ge STA: G.G.23 TOP: Locus

686 ANS:

110. $6x + 20 = x + 40 + 4x - 5$

$6x + 20 = 5x + 35$

$x = 15$

$6((15) + 20 = 110$

PTS: 2 REF: 081031ge STA: G.G.32 TOP: Exterior Angle Theorem

687 ANS:

$180 - (90 + 63) = 27$

PTS: 2 REF: 061230ge STA: G.G.35 TOP: Parallel Lines and Transversals

688 ANS:

$y = \frac{2}{3}x - 9$. The slope of $2x - 3y = 11$ is $-\frac{A}{B} = \frac{-2}{-3} = \frac{2}{3}$. $-5 = \left(\frac{2}{3}\right)(6) + b$

$-5 = 4 + b$

$b = -9$

PTS: 2 REF: 080931ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

689 ANS:

$\frac{5}{5+6+7} \cdot 180 = 50$

PTS: 2 REF: 061529ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

690 ANS:

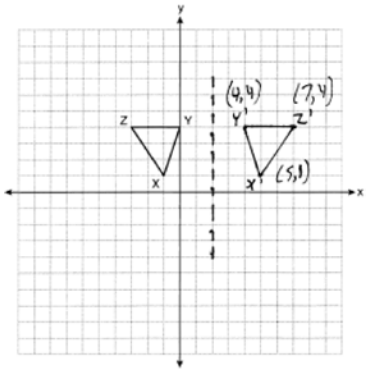
Distance is preserved after the reflection. $2x + 13 = 9x - 8$

$21 = 7x$

$3 = x$

PTS: 2 REF: 011329ge STA: G.G.55 TOP: Properties of Transformations

691 ANS:



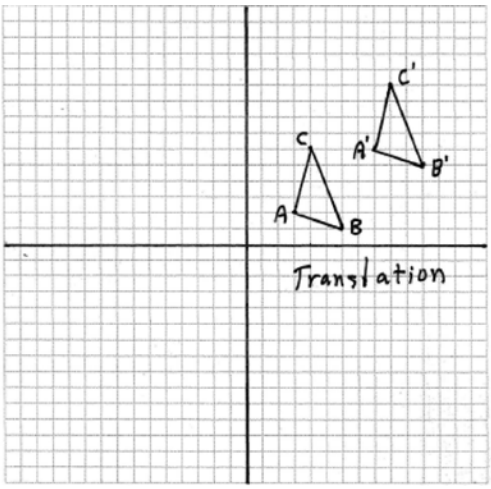
PTS: 2 REF: 061032ge STA: G.G.54 TOP: Reflections
KEY: grids

692 ANS:

$(5-2)180 = 540.\ \frac{540}{5} = 108$ interior. $180 - 108 = 72$ exterior

PTS: 2 REF: 011131ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

693 ANS:



PTS: 2 REF: fall0830ge STA: G.G.55 TOP: Properties of Transformations

694 ANS:

$x^2 + 7^2 = 25^2$

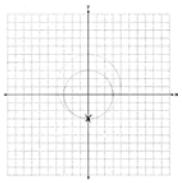
$x^2 + 49 = 625$

$x^2 = 576$

$x = 24$

PTS: 2 REF: 061433ge STA: G.G.50 TOP: Tangents
KEY: point of tangency

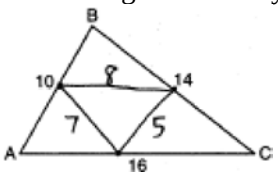
695 ANS:



PTS: 2 REF: 011331ge STA: G.G.23 TOP: Locus

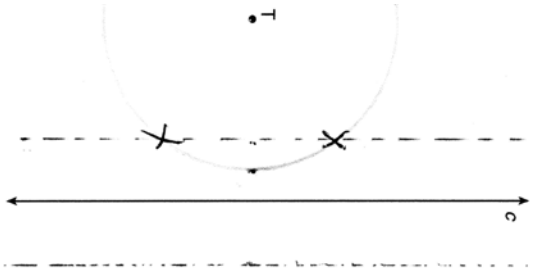
696 ANS:

20. The sides of the triangle formed by connecting the midpoints are half the sides of the original triangle.

$5 + 7 + 8 = 20.$ 

PTS: 2 REF: 060929ge STA: G.G.42 TOP: Midsegments

697 ANS:



PTS: 2 REF: 011434ge STA: G.G.22 TOP: Locus

698 ANS:

$(n-2)180 = (8-2)180 = 1080.$ $\frac{1080}{8} = 135.$

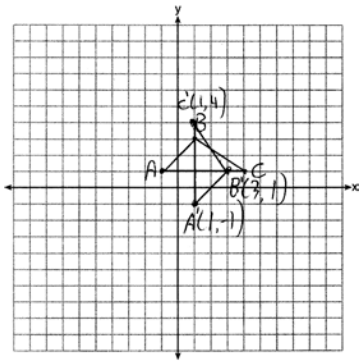
PTS: 2 REF: 061330ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

699 ANS:

$V = \frac{1}{3}\pi(3^2)(8) = 24\pi$

PTS: 2 REF: 081530ge STA: G.G.15 TOP: Volume and Lateral Area

700 ANS:



PTS: 2 REF: 061530ge STA: G.G.54 TOP: Reflections
KEY: grids

701 ANS:

$$180 - \left(\frac{84}{2} + 28\right) = 180 - 70 = 110$$

PTS: 2 REF: 061534ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter

702 ANS:

$$\frac{x-1}{4} = \frac{-3}{8}$$

$$8x - 8 = -12$$

$$8x = -4$$

$$x = -\frac{1}{2}$$

PTS: 2 REF: 011534ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

703 ANS:

Yes. A reflection is an isometry.

PTS: 2 REF: 061132ge STA: G.G.55 TOP: Properties of Transformations

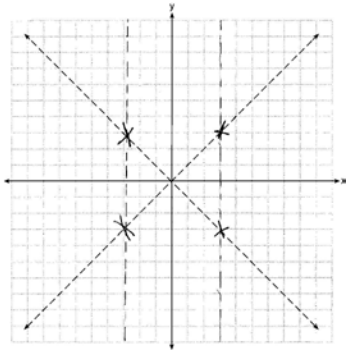
704 ANS:

3. The non-parallel sides of an isosceles trapezoid are congruent. $2x + 5 = 3x + 2$

$$x = 3$$

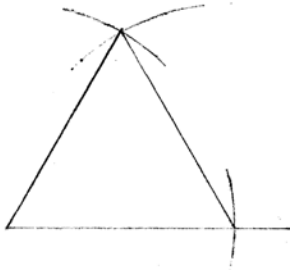
PTS: 2 REF: 080929ge STA: G.G.40 TOP: Trapezoids

705 ANS:



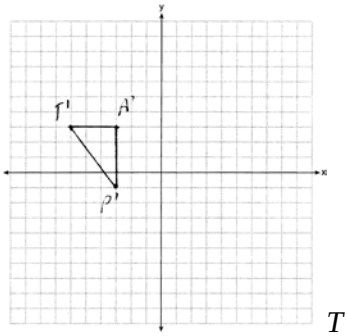
PTS: 2 REF: 081234ge STA: G.G.23 TOP: Locus

706 ANS:



PTS: 2 REF: 081532ge STA: G.G.20 TOP: Constructions

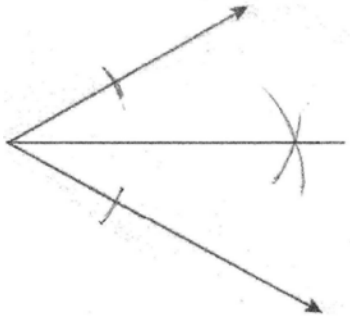
707 ANS:



$T'(-6,3), A'(-3,3), P'(-3,-1)$

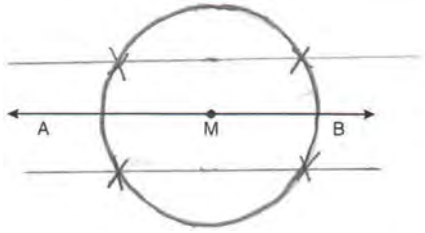
PTS: 2 REF: 061229ge STA: G.G.61
TOP: Analytical Representations of Transformations

708 ANS:



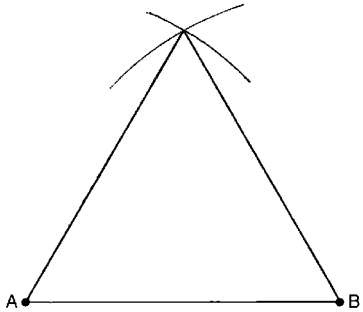
PTS: 2 REF: fall0832ge STA: G.G.17 TOP: Constructions

709 ANS:



PTS: 2 REF: 011230ge STA: G.G.22 TOP: Locus

710 ANS:



PTS: 2 REF: 081032ge STA: G.G.20 TOP: Constructions

711 ANS:

(6,–4). $C_x = \frac{Q_x + R_x}{2}$. $C_y = \frac{Q_y + R_y}{2}$.

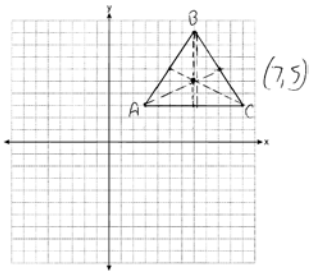
$3.5 = \frac{1 + R_x}{2}$ $\quad 2 = \frac{8 + R_y}{2}$

$7 = 1 + R_x$ $\quad 4 = 8 + R_y$

$6 = R_x$ $\quad -4 = R_y$

PTS: 2 REF: 011031ge STA: G.G.66 TOP: Midpoint
KEY: graph

712 ANS:



(7,5) $m_{\overline{AB}} = \left(\frac{3+7}{2}, \frac{3+9}{2} \right) = (5,6)$ $m_{\overline{BC}} = \left(\frac{7+11}{2}, \frac{9+3}{2} \right) = (9,6)$

PTS: 2 REF: 081134ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter

713 ANS:

True. The first statement is true and the second statement is false. In a disjunction, if either statement is true, the disjunction is true.

PTS: 2 REF: 060933ge STA: G.G.25 TOP: Compound Statements
KEY: disjunction

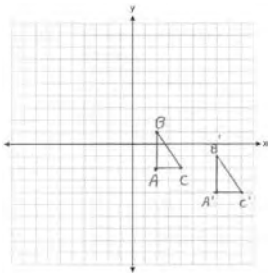
714 ANS:

$SA = 4\pi r^2 = 4\pi \cdot 2.5^2 = 25\pi \approx 78.54$

PTS: 2 REF: 011429ge STA: G.G.16 TOP: Volume and Surface Area

Geometry 4 Point Regents Exam Questions
Answer Section

715 ANS:



$A'(7,-4), B'(7,-1). C'(9,-4)$. The areas are equal because translations preserve distance.

PTS: 4 REF: 011235ge STA: G.G.55 TOP: Properties of Transformations

716 ANS:

$V = \pi r^2 h$. $L = 2\pi rh = 2\pi \cdot 5\sqrt{2} \cdot 12 \approx 533.1$

$600\pi = \pi r^2 \cdot 12$

$50 = r^2$

$\sqrt{25}\sqrt{2} = r$

$5\sqrt{2} = r$

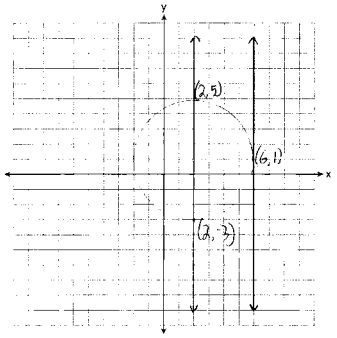
PTS: 4 REF: 011236ge STA: G.G.14 TOP: Volume and Lateral Area

717 ANS:

$h = \sqrt{5^2 - 3^2} = 4$ $V = \frac{1}{3}\pi \cdot 3^2 \cdot 4 = 12\pi$ $V = \pi \cdot 4^2 \cdot 6 = 96\pi$ $\frac{96\pi}{12\pi} = 8$

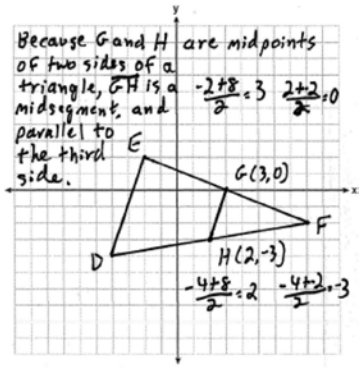
PTS: 4 REF: 011537ge STA: G.G.15 TOP: Volume and Lateral Area

718 ANS:



PTS: 4 REF: 011135ge STA: G.G.23 TOP: Locus

719 ANS:



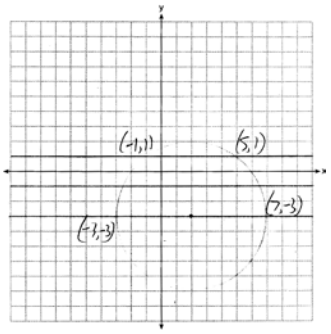
PTS: 4 REF: fall0835ge STA: G.G.42 TOP: Midsegments

720 ANS:

$\overline{JK} \cong \overline{LM}$ because opposite sides of a parallelogram are congruent. $\overline{LM} \cong \overline{LN}$ because of the Isosceles Triangle Theorem. $\overline{LM} \cong \overline{JM}$ because of the transitive property. *JKLM* is a rhombus because all sides are congruent.

PTS: 4 REF: 011036ge STA: G.G.27 TOP: Quadrilateral Proofs

721 ANS:



PTS: 4 REF: 081535ge STA: G.G.23 TOP: Locus

722 ANS:

$\angle B$ and $\angle E$ are right angles because of the definition of perpendicular lines. $\angle B \cong \angle E$ because all right angles are congruent. $\angle BFD$ and $\angle DFE$ are supplementary and $\angle ECA$ and $\angle ACB$ are supplementary because of the definition of supplementary angles. $\angle DFE \cong \angle ACB$ because angles supplementary to congruent angles are congruent. $\triangle ABC \sim \triangle DEF$ because of AA.

PTS: 4 REF: 011136ge STA: G.G.44 TOP: Similarity Proofs

723 ANS:

32. $\frac{16}{20} = \frac{x-3}{x+5}$. $\overline{AC} = x - 3 = 35 - 3 = 32$

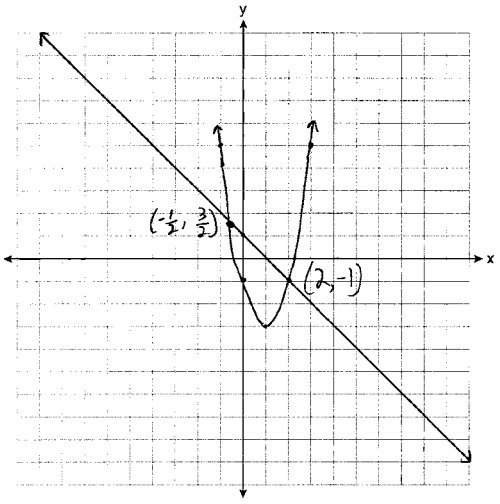
$16x + 80 = 20x - 60$

$140 = 4x$

$35 = x$

PTS: 4 REF: 011137ge STA: G.G.46 TOP: Side Splitter Theorem

724 ANS:



PTS: 4 REF: 061137ge STA: G.G.70 TOP: Quadratic-Linear Systems

725 ANS:

$2(y+10) = 4y - 20$. $\overline{DF} = y + 10 = 20 + 10 = 30$. $\overline{OA} = \overline{OD} = \sqrt{16^2 + 30^2} = 34$

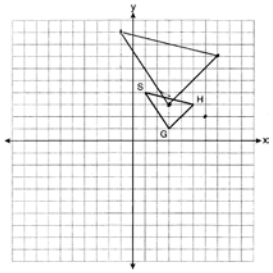
$2y + 20 = 4y - 20$

$40 = 2y$

$20 = y$

PTS: 4 REF: 061336ge STA: G.G.49 TOP: Chords

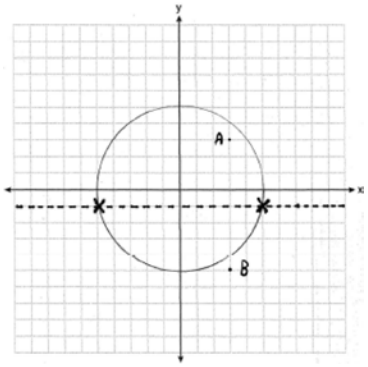
726 ANS:



$G''(3,3), H''(7,7), S''(-1,9)$

PTS: 4 REF: 081136ge STA: G.G.58 TOP: Compositions of Transformations

727 ANS:



PTS: 4 REF: fall0837ge STA: G.G.23 TOP: Locus

728 ANS:

30. $3x + 4x + 5x = 360$. $\text{m}\overset{\frown}{LN} : \text{m}\overset{\frown}{NK} : \text{m}\overset{\frown}{KL} = 90 : 120 : 150$. $\frac{150 - 90}{2} = 30$

$x = 20$

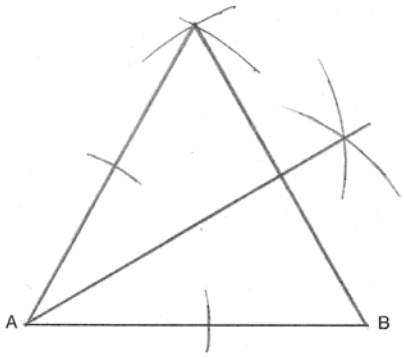
PTS: 4 REF: 061136ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: outside circle

729 ANS:

$\angle D$, $\angle G$ and 24° or $\angle E$, $\angle F$ and 84°. $\text{m}\overset{\frown}{FE} = \frac{2}{15} \times 360 = 48$. Since the chords forming $\angle D$ and $\angle G$ are intercepted by $\overset{\frown}{FE}$, their measure is 24°. $\text{m}\overset{\frown}{GD} = \frac{7}{15} \times 360 = 168$. Since the chords forming $\angle E$ and $\angle F$ are intercepted by $\overset{\frown}{GD}$, their measure is 84°.

PTS: 4 REF: fall0836ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: inscribed

730 ANS:



PTS: 4 REF: 061437ge STA: G.G.17 TOP: Constructions

731 ANS:

$x^2 + 12 + 11x + 5 + 13x - 17 = 180$. $\text{m}\angle A = 6^2 + 12 = 48$. $\angle B$ is the largest angle, so $\overline{AC}$ in the longest side.

$$x^2 + 24x - 180 = 0 \qquad \text{m}\angle B = 11(6) + 5 = 71$$
$$(x + 30)(x - 6) = 0 \qquad \text{m}\angle C = 13(6) - 7 = 61$$
$$x = 6$$

PTS: 4 REF: 011337ge STA: G.G.34 TOP: Angle Side Relationship

732 ANS:

$12x - 4 + 7x + 13 = 180$. $16y + 1 = \dfrac{12y + 1 + 18y + 6}{2}$

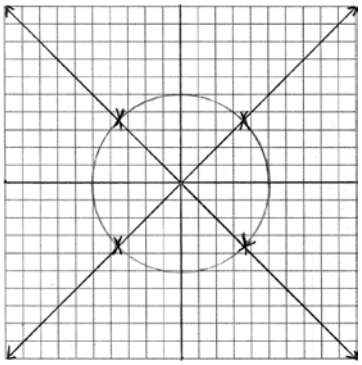
$19x + 9 = 180$ $32y + 2 = 30y + 7$

$19x = 171$ $2y = 5$

$x = 9$ $y = \dfrac{5}{2}$

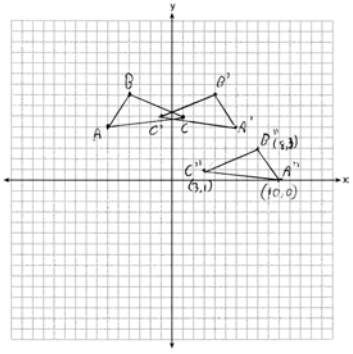
PTS: 4 REF: 081337ge STA: G.G.40 TOP: Trapezoids

733 ANS:



PTS: 4 REF: 011037ge STA: G.G.23 TOP: Locus

734 ANS:

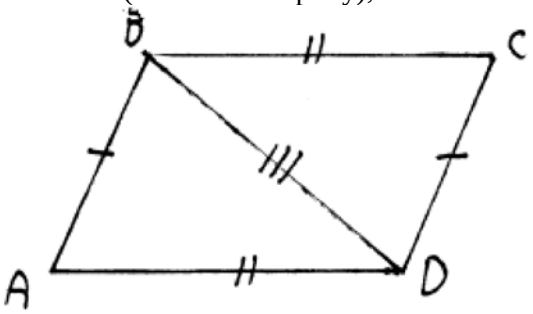


PTS: 3 REF: 011436ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

735 ANS:
36, because a dilation does not affect angle measure. 10, because a dilation does affect distance.

PTS: 4 REF: 011035ge STA: G.G.59 TOP: Properties of Transformations

736 ANS:
$\overline{BD} \cong \overline{DB}$ (Reflexive Property); $\triangle ABD \cong \triangle CDB$ (SSS); $\angle BDC \cong \angle ABD$ (CPCTC).

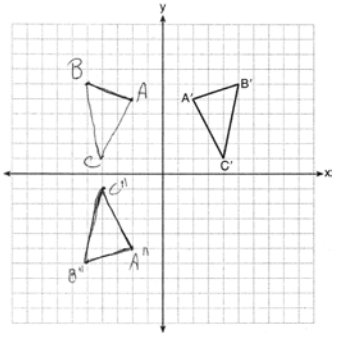


PTS: 4 REF: 061035ge STA: G.G.27 TOP: Quadrilateral Proofs

737 ANS:
$l = \sqrt{10^2 + 3^2} = \sqrt{109}$ $L = \pi r l = \pi(3)(\sqrt{109}) \approx 98.4$

PTS: 4 REF: 081436ge STA: G.G.15 TOP: Volume and Lateral Area

738 ANS:



$r_{x\text{-axis}}$

PTS: 4 REF: 061435ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

739 ANS:
$L = 2\pi rh = 2\pi \cdot 3 \cdot 5 \approx 94.25$. $V = \pi r^2 h = \pi(3)^2(5) \approx 141.37$

PTS: 4 REF: 011335ge STA: G.G.14 TOP: Volume and Lateral Area

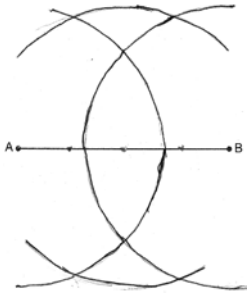
740 ANS:
$6x - 6 = 4x + 2$ $m\angle BCA = 4(4) + 2 = 18$ $7y - 15 = 5y - 1$ $m\angle BAC = 5(7) - 1 = 34$ $m\angle B = 180 - (18 + 34) = 128$

$2x = 8$ $2y = 14$

$x = 4$ $y = 7$

PTS: 4 REF: 061536ge STA: G.G.38 TOP: Parallelograms

741 ANS:



PTS: 4 REF: 081437ge STA: G.G.18 TOP: Constructions

742 ANS:

11. $x^2 + 6x = x + 14$. $6(2) - 1 = 11$

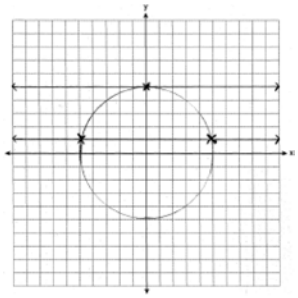
$x^2 + 5x - 14 = 0$

$(x + 7)(x - 2) = 0$

$x = 2$

PTS: 2 REF: 081235ge STA: G.G.38 TOP: Parallelograms

743 ANS:



PTS: 4 REF: 080936ge STA: G.G.23 TOP: Locus

744 ANS:

$x^2 - 8x = 5x + 30$. $m\angle C = 4(15) - 5 = 55$

$x^2 - 13x - 30 = 0$

$(x - 15)(x + 2) = 0$

$x = 15$

PTS: 4 REF: 061337ge STA: G.G.45 TOP: Similarity
KEY: basic

745 ANS:

$y = \frac{2}{3}x + 1$. $2y + 3x = 6$. $y = mx + b$

$2y = -3x + 6$ $\quad 5 = \frac{2}{3}(6) + b$

$y = -\frac{3}{2}x + 3$ $\quad 5 = 4 + b$

$m = -\frac{3}{2}$ $\quad 1 = b$

$y = \frac{2}{3}x + 1$

$m_{\perp} = \frac{2}{3}$

PTS: 4 REF: 061036ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

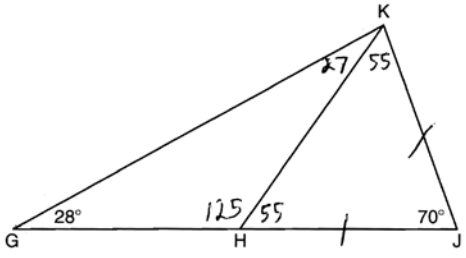
746 ANS:

$M = \left(\frac{4+8}{2}, \frac{2+6}{2}\right) = (6,4)$ $m = \frac{6-2}{8-4} = \frac{4}{4} = 1$ $m_{\perp} = -1$ $y - 1 = -(x - 6)$

PTS: 4 REF: 081536ge STA: G.G.68 TOP: Perpendicular Bisector

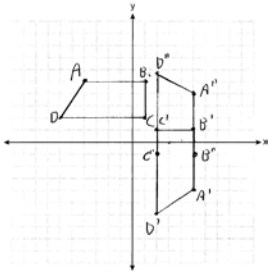
747 ANS:

No, $\angle KGH$ is not congruent to $\angle GKH$.



PTS: 2 REF: 081135ge STA: G.G.31 TOP: Isosceles Triangle Theorem

748 ANS:



$A'(5,-4), B'(5,1), C'(2,1), D'(2,-6); A''(5,4), B''(5,-1), C''(2,-1), D''(2,6)$

PTS: 4 REF: 061236ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

749 ANS:

Midpoint: $\left(\frac{-4+4}{2}, \frac{2+(-4)}{2}\right) = (0,-1)$. Distance: $d = \sqrt{(-4-4)^2 + (2-(-4))^2} = \sqrt{100} = 10$

$r = 5$

$r^2 = 25$

$x^2 + (y+1)^2 = 25$

PTS: 4 REF: 061037ge STA: G.G.71 TOP: Equations of Circles

750 ANS:

$\overline{MT}$ and $\overline{HA}$ intersect at B, $\overline{MA} \parallel \overline{HT}$, and $\overline{MT}$ bisects $\overline{HA}$ (Given). $\angle MBA \cong \angle TBH$ (Vertical Angles). $\angle A \cong \angle H$ (Alternate Interior Angles). $\overline{BH} \cong \overline{BA}$ (The bisection of a line segment creates two congruent segments). $\triangle MAB \cong \triangle THB$ (ASA). $\overline{MA} \cong \overline{HT}$ (CPCTC).

PTS: 4 REF: 081435ge STA: G.G.27 TOP: Triangle Proofs

751 ANS:

$\angle B$ and $\angle C$ are right angles because perpendicular lines form right angles. $\angle B \cong \angle C$ because all right angles are congruent. $\angle AEB \cong \angle DEC$ because vertical angles are congruent. $\triangle ABE \cong \triangle DCE$ because of ASA. $\overline{AB} \cong \overline{DC}$ because CPCTC.

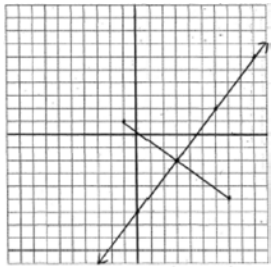
PTS: 4 REF: 061235ge STA: G.G.27 TOP: Triangle Proofs

752 ANS:

$y = \frac{4}{3}x - 6$. $M_x = \frac{-1+7}{2} = 3$ The perpendicular bisector goes through $(3,-2)$ and has a slope of $\frac{4}{3}$.

$M_y = \frac{1+(-5)}{2} = -2$

$m = \frac{1-(-5)}{-1-7} = -\frac{3}{4}$

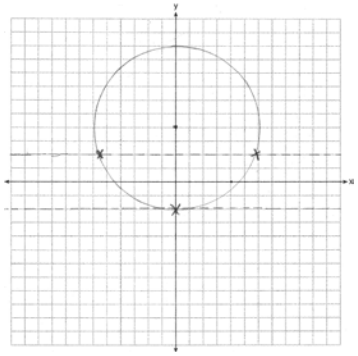


$y - y_M = m(x - x_M)$.

$y - 1 = \frac{4}{3}(x-2)$

PTS: 4 REF: 080935ge STA: G.G.68 TOP: Perpendicular Bisector

753 ANS:



PTS: 4 REF: 061436ge STA: G.G.23 TOP: Locus

754 ANS:

$x + 3x - 60 + 5x - 30 = 180$

$9x - 90 = 180$

$9x = 270$

$x = 30 = \text{m}\angle D$

$5(30) - 30 = 120$

$\text{m}\angle BAC = 180 - 120 = 60$

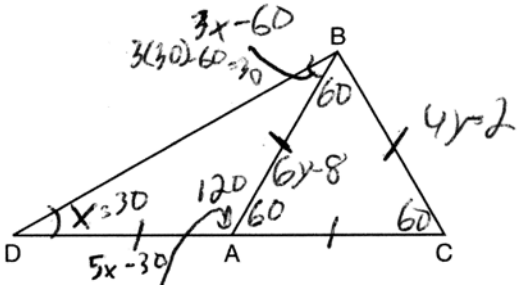
$6y - 8 = 4y - 2$

$2y = 6$

$y = 3$

$\overline{DC} = 10 + 10 = 20$

$4(3) - 2 = 10 = \overline{BC}$



PTS: 3 REF: 011435ge STA: G.G.31 TOP: Isosceles Triangle Theorem

755 ANS:

$4x \cdot x = 6^2$

$4x^2 = 36$

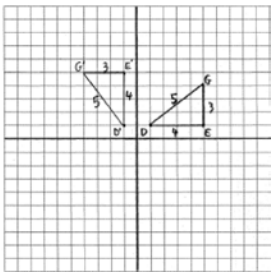
$x^2 = 9$

$x = 3$

$\overline{BD} = 4(3) = 12$

PTS: 4 REF: 011437ge STA: G.G.47 TOP: Similarity
KEY: altitude

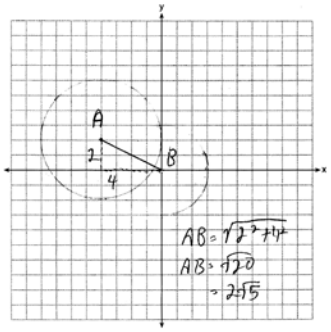
756 ANS:



$D'(-1,1)$, $E'(-1,5)$, $G'(-4,5)$

PTS: 4 REF: 080937ge STA: G.G.55 TOP: Properties of Transformations

757 ANS:



PTS: 4 REF: 081537ge STA: G.G.74 TOP: Graphing Circles

758 ANS:

2 $\dfrac{x+2}{x} = \dfrac{x+6}{4}$

$x^2 + 6x = 4x + 8$

$x^2 + 2x - 8 = 0$

$(x+4)(x-2) = 0$

$x = 2$

PTS: 4 REF: 081137ge STA: G.G.45 TOP: Similarity

KEY: basic

759 ANS:

Yes, $m\angle ABD = m\angle BDC = 44$ $180 - (93 + 43) = 44$ $x + 19 + 2x + 6 + 3x + 5 = 180$. Because alternate interior

$6x + 30 = 180$

$6x = 150$

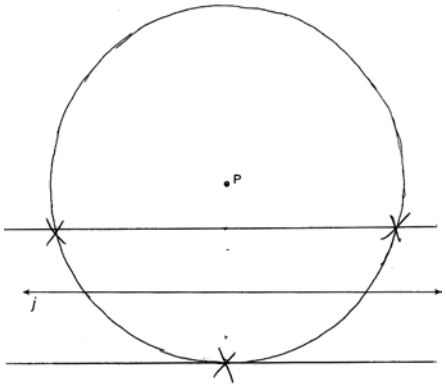
$x = 25$

$x + 19 = 44$

angles $\angle ABD$ and $\angle CDB$ are congruent, $\overline{AB}$ is parallel to $\overline{DC}$.

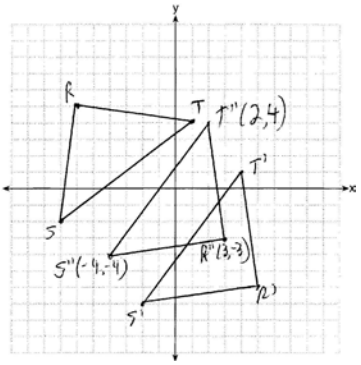
PTS: 4 REF: 081035ge STA: G.G.35 TOP: Parallel Lines and Transversals

760 ANS:



PTS: 4 REF: 061537ge STA: G.G.22 TOP: Locus

761 ANS:



PTS: 4 REF: 081236ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

762 ANS:

2.4. $5a = 4^2 \quad 5b = 3^2 \quad h^2 = ab$

$a = 3.2 \quad b = 1.8 \quad h^2 = 3.2 \cdot 1.8$

$h = \sqrt{5.76} = 2.4$

PTS: 4 REF: 081037ge STA: G.G.47 TOP: Similarity
KEY: leg

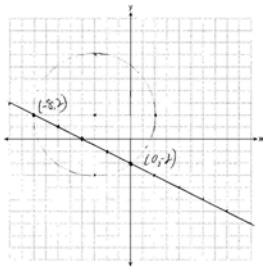
763 ANS:

18. If the ratio of *TA* to *AC* is 1:3, the ratio of *TE* to *ES* is also 1:3. $x + 3x = 24$. $3(6) = 18$.

$x = 6$

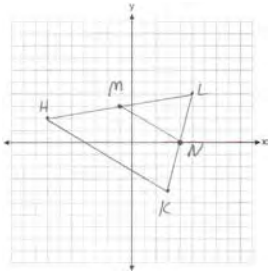
PTS: 4 REF: 060935ge STA: G.G.50 TOP: Tangents
KEY: common tangency

764 ANS:



PTS: 4 REF: 081237ge STA: G.G.70 TOP: Quadratic-Linear Systems

765 ANS:



$M\left(\frac{-7+5}{2}, \frac{2+4}{2}\right) = M(-1,3)$. $N\left(\frac{3+5}{2}, \frac{-4+4}{2}\right) = N(4,0)$. $\overline{MN}$ is a midsegment.

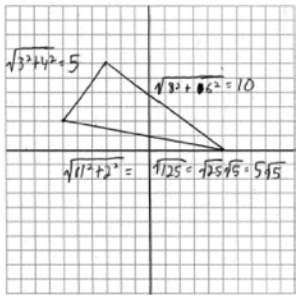
PTS: 4 REF: 011237ge STA: G.G.42 TOP: Midsegments

766 ANS:

$\triangle ABC$, $\overline{BD}$ bisects $\angle ABC$, $\overline{BD} \perp \overline{AC}$ (Given). $\angle CBD \cong \angle ABD$ (Definition of angle bisector). $\overline{BD} \cong \overline{BD}$ (Reflexive property). $\angle CDB$ and $\angle ADB$ are right angles (Definition of perpendicular). $\angle CDB \cong \angle ADB$ (All right angles are congruent). $\triangle CDB \cong \triangle ADB$ (SAS). $\overline{AB} \cong \overline{CB}$ (CPCTC).

PTS: 4 REF: 081335ge STA: G.G.27 TOP: Triangle Proofs

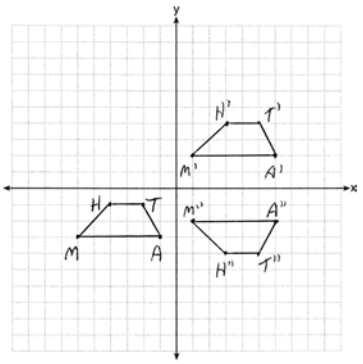
767 ANS:



$15 + 5\sqrt{5}$.

PTS: 4 REF: 060936ge STA: G.G.69 TOP: Triangles in the Coordinate Plane

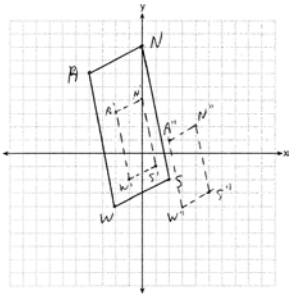
768 ANS:



$M''(1,-2), A''(6,-2), T''(5,-4), H''(3,-4)$

PTS: 4 REF: 081336ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

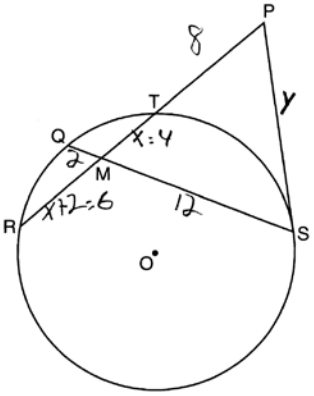
769 ANS:



$S''(5,-3)$, $W''(3,-4)$, $A''(2,1)$, and $N''(4,2)$

PTS: 4 REF: 061335ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

770 ANS:



$x(x+2) = 12 \cdot 2$. $\overline{RT} = 6 + 4 = 10$. $y \cdot y = 18 \cdot 8$

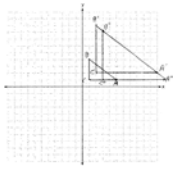
$x^2 + 2x - 24 = 0$ $\qquad y^2 = 144$

$(x+6)(x-4) = 0$ $\qquad y = 12$

$x = 4$

PTS: 4 REF: 061237ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: tangent and secant

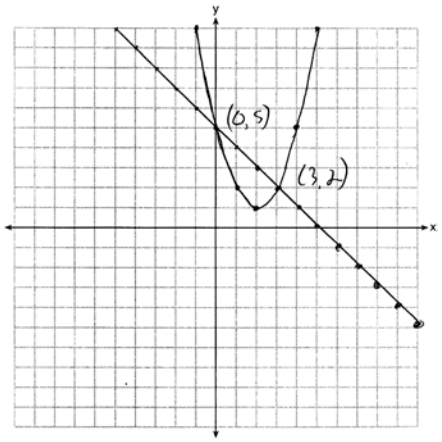
771 ANS:



$A''(11,1),\ B''(3,7),\ C''(3,1)$

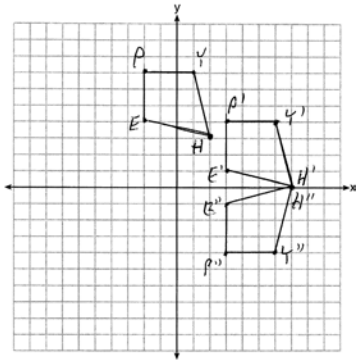
PTS: 4 REF: 011336ge STA: G.G.58 TOP: Compositions of Transformations

772 ANS:



PTS: 4 REF: 061535ge STA: G.G.70 TOP: Quadratic-Linear Systems

773 ANS:

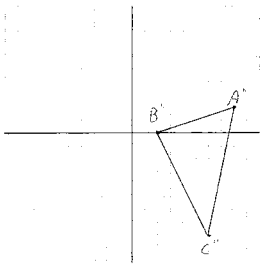


$H'(7,0), Y'(6,4), P'(3,4), E'(3,1)$

$H''(7,0), Y''(6,-4), P''(3,-4), E''(3,-1)$

PTS: 4 REF: 011535ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

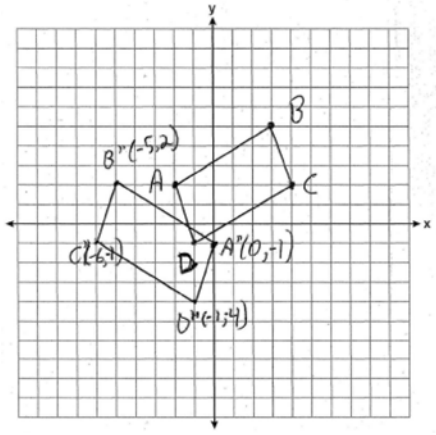
774 ANS:



$A''(8,2),\ B''(2,0),\ C''(6,-8)$

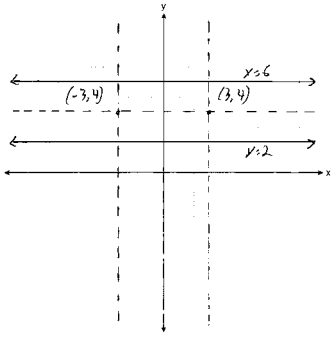
PTS: 4 REF: 081036ge STA: G.G.58 TOP: Compositions of Transformations

775 ANS:



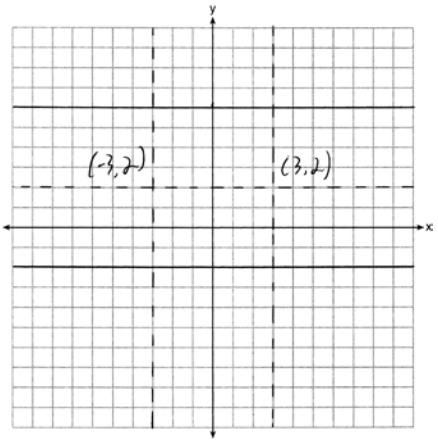
PTS: 4 REF: 060937ge STA: G.G.54 TOP: Compositions of Transformations
KEY: grids

776 ANS:



PTS: 4 REF: 061135ge STA: G.G.23 TOP: Locus

777 ANS:



PTS: 4 REF: 011536ge STA: G.G.23 TOP: Locus

Geometry 6 Point Regents Exam Questions: Due to ExamView limitations, the following problems can not be numbered correctly. Precede each number with a 7
Answer Section

78 ANS:

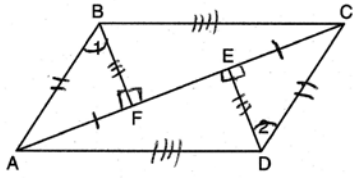
52, 40, 80. $360 - (56 + 112) = 192$. $\frac{192 - 112}{2} = 40$. $\frac{112 + 48}{2} = 80$

$\frac{1}{4} \times 192 = 48$

$\frac{56 + 48}{2} = 52$

PTS: 6 REF: 081238ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: mixed

79 ANS:



$\overline{FE} \cong \overline{FE}$ (Reflexive Property); $\overline{AE} - \overline{FE} \cong \overline{FC} - \overline{EF}$ (Line Segment Subtraction Theorem); $\overline{AF} \cong \overline{CE}$ (Substitution); $\angle BFA \cong \angle DEC$ (All right angles are congruent); $\triangle BFA \cong \triangle DEC$ (AAS); $\overline{AB} \cong \overline{CD}$ and $\overline{BF} \cong \overline{DE}$ (CPCTC); $\angle BFC \cong \angle DEA$ (All right angles are congruent); $\triangle BFC \cong \triangle DEA$ (SAS); $\overline{AD} \cong \overline{CB}$ (CPCTC); $ABCD$ is a parallelogram (opposite sides of quadrilateral $ABCD$ are congruent)

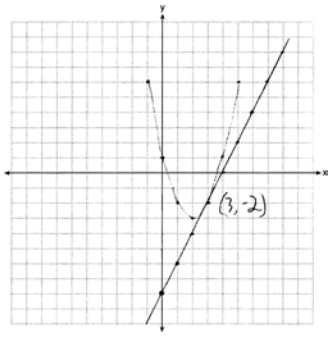
PTS: 6 REF: 080938ge STA: G.G.27 TOP: Quadrilateral Proofs

80 ANS:

Rectangle $ABCD$ with points E and F on side $\overline{AB}$, segments CE and DF intersect at G, and $\angle ADG \cong \angle BCE$ are given. $\overline{AD} \cong \overline{BC}$ because opposite sides of a rectangle are congruent. $\angle A$ and $\angle B$ are right angles and congruent because all angles of a rectangle are right and congruent. $\triangle ADF \cong \triangle BCE$ by ASA. $\overline{AF} \cong \overline{BE}$ per CPCTC. $\overline{EF} \cong \overline{FE}$ under the Reflexive Property. $\overline{AF} - \overline{EF} \cong \overline{BE} - \overline{FE}$ using the Subtraction Property of Segments. $\overline{AE} \cong \overline{BF}$ because of the Definition of Segments.

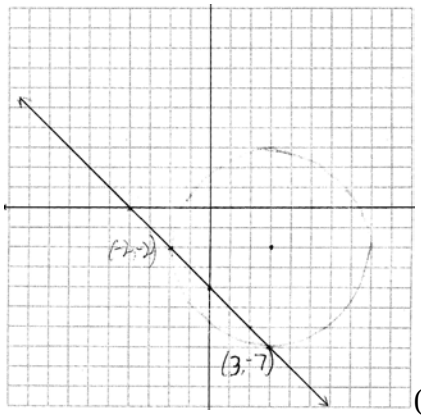
PTS: 6 REF: 011338ge STA: G.G.27 TOP: Quadrilateral Proofs

81 ANS:



PTS: 6 REF: 061238ge STA: G.G.70 TOP: Quadratic-Linear Systems

82 ANS:



$(x-3)^2+(y+2)^2=25$ $m=\dfrac{-6--4}{0-2}=\dfrac{-2}{-2}=1$ $M\left(\dfrac{0+2}{2},\dfrac{-6+-4}{2}\right)=M(1,-5)$

$m_{\perp}=-1$

$-5=(-1)(1)+b$

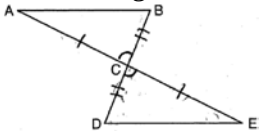
$-4=b$

$y=-x-4$

PTS: 6 REF: 081438ge STA: G.G.23 TOP: Locus

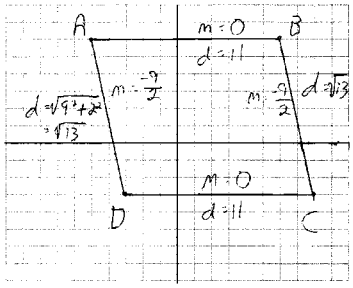
83 ANS:

$\overline{AC}\cong\overline{EC}$ and $\overline{DC}\cong\overline{BC}$ because of the definition of midpoint. $\angle ACB\cong\angle ECD$ because of vertical angles. $\triangle ABC\cong\triangle EDC$ because of SAS. $\angle CDE\cong\angle CBA$ because of CPCTC. $\overline{BD}$ is a transversal intersecting $\overline{AB}$ and $\overline{ED}$. Therefore $\overline{AB}\parallel\overline{DE}$ because $\angle CDE$ and $\angle CBA$ are congruent alternate interior angles.



PTS: 6 REF: 060938ge STA: G.G.27 TOP: Triangle Proofs

84 ANS:



$\overline{AB}\parallel\overline{CD}$ and $\overline{AD}\parallel\overline{CB}$ because their slopes are equal. $ABCD$ is a parallelogram because opposite side are parallel. $\overline{AB}\neq\overline{BC}$. $ABCD$ is not a rhombus because all sides are not equal. $\overline{AB}\sim\perp\overline{BC}$ because their slopes are not opposite reciprocals. $ABCD$ is not a rectangle because $\angle ABC$ is not a right angle.

PTS: 4 REF: 081038ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

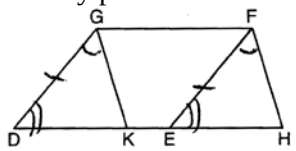
85 ANS:
$\overline{OA} \cong \overline{OB}$ because all radii are equal. $\overline{OP} \cong \overline{OP}$ because of the reflexive property. $\overline{OA} \perp \overline{PA}$ and $\overline{OB} \perp \overline{PB}$ because tangents to a circle are perpendicular to a radius at a point on a circle. $\angle PAO$ and $\angle PBO$ are right angles because of the definition of perpendicular. $\angle PAO \cong \angle PBO$ because all right angles are congruent. $\triangle AOP \cong \triangle BOP$ because of HL. $\angle AOP \cong \angle BOP$ because of CPCTC.

PTS: 6 REF: 061138ge STA: G.G.27 TOP: Circle Proofs

86 ANS:
2. The diameter of a circle is $\perp$ to a tangent at the point of tangency. 4. An angle inscribed in a semicircle is a right angle. 5. All right angles are congruent. 7. AA. 8. Corresponding sides of congruent triangles are in proportion. 9. The product of the means equals the product of the extremes.

PTS: 6 REF: 011438ge STA: G.G.27 TOP: Circle Proofs

87 ANS:
Parallelogram *DEFG*, *K* and *H* are points on $\overrightarrow{DE}$ such that $\angle DGK \cong \angle EFH$ and $\overline{GK}$ and $\overline{FH}$ are drawn (given). $\overline{DG} \cong \overline{EF}$ (opposite sides of a parallelogram are congruent). $\overline{DG} \parallel \overline{EF}$ (opposite sides of a parallelogram are parallel). $\angle D \cong \angle FEH$ (corresponding angles formed by parallel lines and a transversal are congruent).



$\triangle DGK \cong \triangle EFH$ (ASA). $\overline{DK} \cong \overline{EH}$ (CPCTC).

PTS: 6 REF: 081538ge STA: G.G.27 TOP: Quadrilateral Proofs

88 ANS:
$m_{\overline{AB}} = \left(\frac{-6+2}{2}, \frac{-2+8}{2}\right) = D(2,3)$ $m_{\overline{BC}} = \left(\frac{2+6}{2}, \frac{8+-2}{2}\right) = E(4,3)$ $F(0,-2)$. To prove that *ADEF* is a parallelogram, show that both pairs of opposite sides of the parallelogram are parallel by showing the opposite sides have the same slope: $m_{\overline{AD}} = \frac{3--2}{-2--6} = \frac{5}{4}$ $\overline{AF} \parallel \overline{DE}$ because all horizontal lines have the same slope. *ADEF*

$$m_{FE} = \frac{3--2}{4-0} = \frac{5}{4}$$

is not a rhombus because not all sides are congruent. $AD = \sqrt{5^2 + 4^2} = \sqrt{41}$ $AF = 6$

PTS: 6 REF: 081138ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

89 ANS:

$m_{\overline{JM}} = \frac{1-4}{-3-3} = \frac{-3}{-6} = \frac{1}{2}$ Since both opposite sides have equal slopes and are parallel, *JKLM* is a parallelogram.

$m_{\overline{ML}} = \frac{4--2}{3-7} = \frac{6}{-4} = -\frac{3}{2}$

$m_{\overline{LK}} = \frac{-2--5}{7-1} = \frac{3}{6} = \frac{1}{2}$

$m_{\overline{KJ}} = \frac{-5-1}{1--3} = \frac{-6}{4} = -\frac{3}{2}$

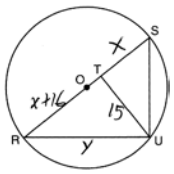
$\overline{JM} = \sqrt{(-3-3)^2 + (1-4)^2} = \sqrt{45}$. $\overline{JM}$ is not congruent to $\overline{ML}$, so *JKLM* is not a rhombus since not all sides

$\overline{ML} = \sqrt{(7-3)^2 + (-2-4)^2} = \sqrt{52}$

are congruent.

PTS: 6 REF: 061438ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

90 ANS:



$x(x+16) = 15^2$ $25 \cdot 34 = y^2$

$x^2 + 16x - 225 = 0$ $5\sqrt{34} = y$

$(x+25)(x-9) = 0$

$x = 9$

PTS: 6 REF: 011538ge STA: G.G.47 TOP: Similarity

KEY: leg

91 ANS:

Because $\overline{AB} \parallel \overline{DC}$, $\overset{\frown}{AD} \cong \overset{\frown}{BC}$ since parallel chords intersect congruent arcs. $\angle BDC \cong \angle ACD$ because inscribed angles that intercept congruent arcs are congruent. $\overline{AD} \cong \overline{BC}$ since congruent chords intersect congruent arcs. $\angle DAC \cong \angle DBC$ because inscribed angles that intercept the same arc are congruent. Therefore, $\triangle ACD \cong \triangle BDC$ because of AAS.

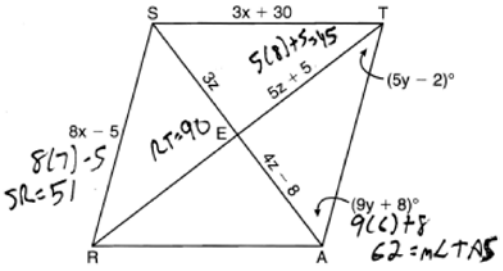
PTS: 6 REF: fall0838ge STA: G.G.27 TOP: Circle Proofs

92 ANS:

$\triangle MAH$, $\overline{MH} \cong \overline{AH}$ and medians $\overline{AB}$ and $\overline{MT}$ are given. $\overline{MA} \cong \overline{AM}$ (reflexive property). $\triangle MAH$ is an isosceles triangle (definition of isosceles triangle). $\angle AMB \cong \angle MAT$ (isosceles triangle theorem). B is the midpoint of $\overline{MH}$ and T is the midpoint of $\overline{AH}$ (definition of median). $\text{m}\overline{MB} = \frac{1}{2}\text{m}\overline{MH}$ and $\text{m}\overline{AT} = \frac{1}{2}\text{m}\overline{AH}$ (definition of midpoint). $\overline{MB} \cong \overline{AT}$ (multiplication postulate). $\triangle MBA \cong \triangle ATM$ (SAS). $\angle MBA \cong \angle ATM$ (CPCTC).

PTS: 6 REF: 061338ge STA: G.G.27 TOP: Triangle Proofs

93 ANS:



$8x - 5 = 3x + 30$. $4z - 8 = 3z$. $9y + 8 + 5y - 2 = 90$.

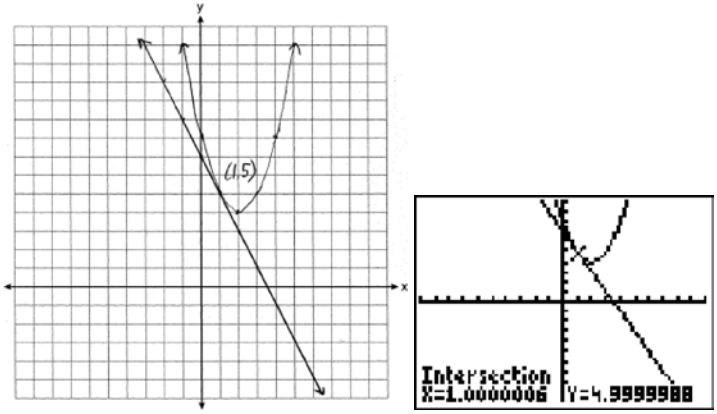
$5x = 35$ $z = 8$ $14y + 6 = 90$

$x = 7$ $14y = 84$

$y = 6$

PTS: 6 REF: 061038ge STA: G.G.39 TOP: Special Parallelograms

94 ANS:



PTS: 6 REF: 011038ge STA: G.G.70 TOP: Quadratic-Linear Systems

95 ANS:

$M\left(\frac{-7+-3}{2}, \frac{4+6}{2}\right) = M(-5,5)$. $m_{\overline{MN}} = \frac{5-3}{-5-0} = \frac{2}{-5}$. Since both opposite sides have equal slopes and are

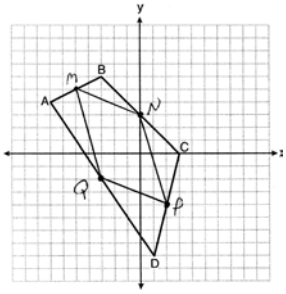
$N\left(\frac{-3+3}{2}, \frac{6+0}{2}\right) = N(0,3)$ $m_{\overline{PQ}} = \frac{-4--2}{2--3} = \frac{-2}{5}$

$P\left(\frac{3+1}{2}, \frac{0+-8}{2}\right) = P(2,-4)$ $m_{\overline{NA}} = \frac{3--4}{0-2} = \frac{7}{-2}$

$Q\left(\frac{-7+1}{2}, \frac{4+-8}{2}\right) = Q(-3,-2)$ $m_{\overline{QM}} = \frac{-2-5}{-3--5} = \frac{-7}{2}$

parallel, *MNPQ* is a parallelogram. $\overline{MN} = \sqrt{(-5-0)^2 + (5-3)^2} = \sqrt{29}$. $\overline{MN}$ is not congruent to $\overline{NP}$, so *MNPQ*

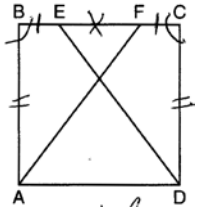
$\overline{NA} = \sqrt{(0-2)^2 + (3--4)^2} = \sqrt{53}$



is not a rhombus since not all sides are congruent.

PTS: 6 REF: 081338ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

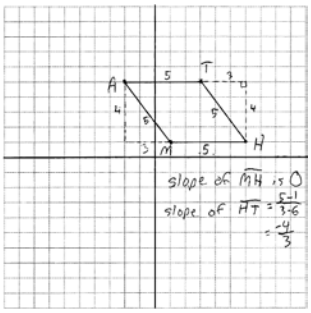
96 ANS:



Square *ABCD*; *E* and *F* are points on $\overline{BC}$ such that $\overline{BE} \cong \overline{FC}$; $\overline{AF}$ and $\overline{DE}$ drawn (Given). $\overline{AB} \cong \overline{CD}$ (All sides of a square are congruent). $\angle ABF \cong \angle DCE$ (All angles of a square are equiangular). $\overline{EF} \cong \overline{FE}$ (Reflexive property). $\overline{BE} + \overline{EF} \cong \overline{FC} + \overline{FE}$ (Additive property of line segments). $\overline{BF} \cong \overline{CE}$ (Angle addition). $\triangle ABF \cong \triangle DCE$ (SAS). $\overline{AF} \cong \overline{DE}$ (CPCTC).

PTS: 6 REF: 061538ge STA: G.G.27 TOP: Quadrilateral Proofs

97 ANS:



The length of each side of quadrilateral is 5. Since each side is congruent, quadrilateral *MATH* is a rhombus. The slope of $\overline{MH}$ is 0 and the slope of $\overline{HT}$ is $-\frac{4}{3}$. Since the slopes are not negative reciprocals, the sides are not perpendicular and do not form rights angles. Since adjacent sides are not perpendicular, quadrilateral *MATH* is not a square.

PTS: 6 REF: 011138ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

98 ANS:

Quadrilateral *ABCD*, $\overline{AD} \cong \overline{BC}$ and $\angle DAE \cong \angle BCE$ are given. $\overline{AD} \| \overline{BC}$ because if two lines are cut by a transversal so that a pair of alternate interior angles are congruent, the lines are parallel. *ABCD* is a parallelogram because if one pair of opposite sides of a quadrilateral are both congruent and parallel, the quadrilateral is a parallelogram. $\overline{AE} \cong \overline{CE}$ because the diagonals of a parallelogram bisect each other. $\angle FEA \cong \angle GEC$ as vertical angles. $\triangle AEF \cong \triangle CEG$ by ASA.

PTS: 6 REF: 011238ge STA: G.G.27 TOP: Quadrilateral Proofs