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REGENTS BY PERFORMANCE INDICATOR: TOPIC

NY Geometry Regents Exam Questions
from Fall 2008 to August 2013 Sorted by PI: Topic

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Geometry Regents Exam Questions by Performance Indicator: Topic

LINEAR EQUATIONS

G.G.62: PARALLEL AND PERPENDICULAR LINES

1 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 $-\frac{5}{3}$

2 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 $\frac{3}{2}$

3 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 $-\frac{4}{3}$

4 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

5 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

6 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 $\frac{5}{3}$

7 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 $\frac{1}{2}$

8 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 $\frac{1}{10}$

9 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 $\frac{1}{2}$

10 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 $3x + y = 0$

11 Find the slope of a line perpendicular to the line whose equation is $2y - 6x = 4$.

G.G.63: PARALLEL AND PERPENDICULAR LINES

12 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

13 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

14 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

15 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°.

16 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

17 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.

18 Determine whether the two lines represented by the equations $y = 2x + 3$ and $2y + x = 6$ are parallel, perpendicular, or neither. Justify your response.

19 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.

20 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 $y - 2x = 3$

21 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 $2y + 10x = 8$

22 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 $y = \frac{2}{3}x - 4$

23 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

24 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 $3y = -2x + 12$

G.G.64: PARALLEL AND PERPENDICULAR LINES

25 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 $y = -2x - 9$

26 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 $y=\frac{1}{3}x-2$

27 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 $y=\frac{5}{3}x+1$

28 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 $y=-\frac{1}{3}x+3$

29 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 $y=-2x-5$

30 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 $y=-\frac{3}{2}x+8$

31 Find an equation of the line passing through the point $(6,5)$ and perpendicular to the line whose equation is $2y+3x=6$.

G.G.65: PARALLEL AND PERPENDICULAR LINES

32 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 $y=-\frac{1}{2}x-\frac{25}{2}$

33 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 $y=-2x+17$

34 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 $y=\frac{3}{2}x+6$

35 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 $3x+4y=14$

36 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 $y=\frac{1}{2}x+1$

37 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 $y=2x-1$

38 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 $y=-\frac{3}{2}x+2$

39 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 $y=-\frac{2}{3}x+\frac{8}{3}$

40 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 $y=\frac{3}{2}x-8$

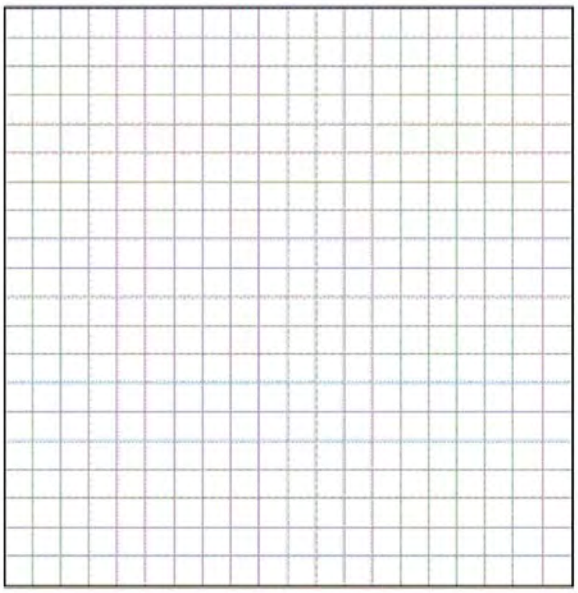
4 $y=\frac{3}{2}x-5$

41 Find an equation of the line passing through the point $(5,4)$ and parallel to the line whose equation is $2x+y=3$.

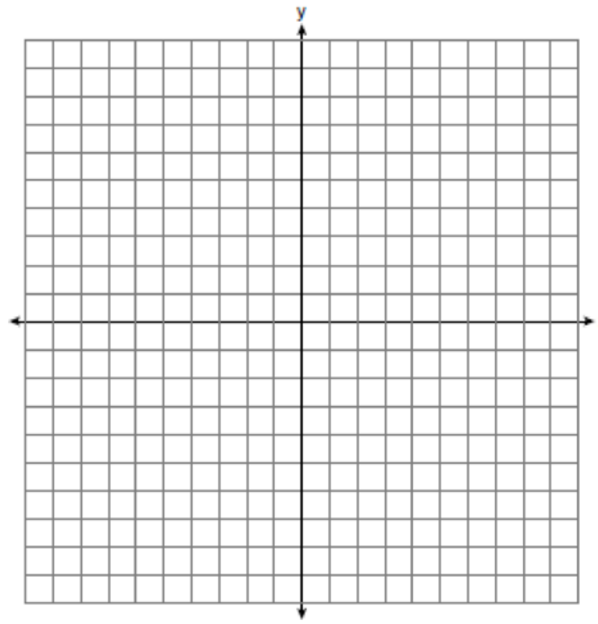
42 Write an equation of the line that passes through the point $(6,-5)$ and is parallel to the line whose equation is $2x - 3y = 11$.

G.G.68: PERPENDICULAR BISECTOR

43 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]



44 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]



45 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 $y = 3$

46 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 $y = 2x - 12$

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

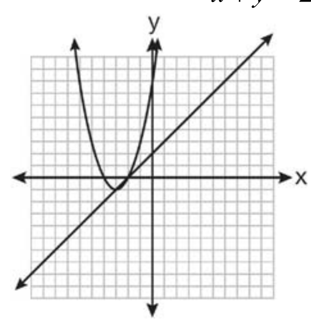
1 $y = 2x - 6$
2 $y = -2x + 4$
3 $y = \frac{1}{2}x + \frac{5}{2}$
4 $y = -\frac{1}{2}x + \frac{19}{2}$

SYSTEMS

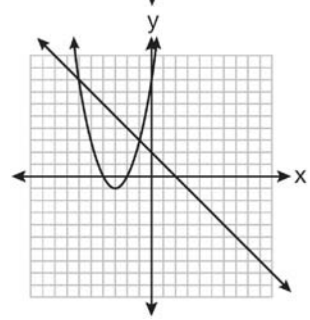
G.G.70: QUADRATIC-LINEAR SYSTEMS

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

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



1



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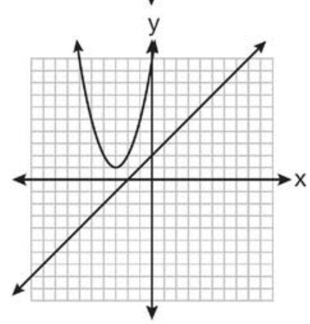

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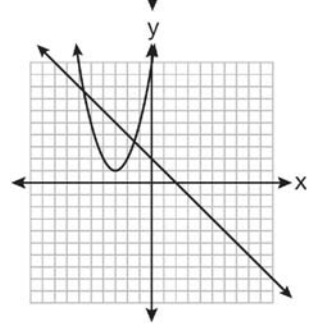
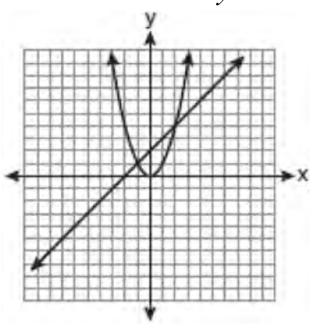


4

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

$$y = -x + 2$$

$$y = x^2$$

1


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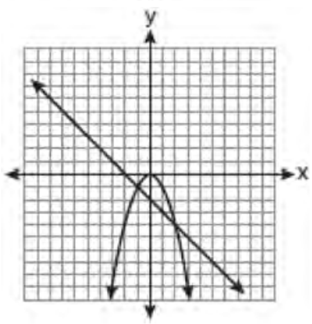

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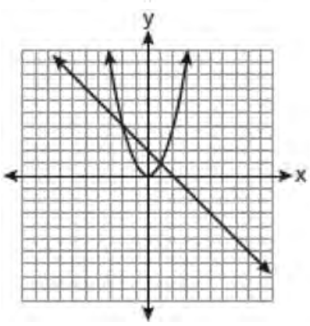

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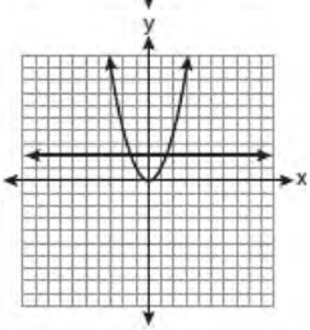


50 Given the system of equations: $y = x^2 - 4x$

$$x = 4$$

The number of points of intersection is

1 1
2 2
3 3
4 0

51 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

52 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 $(3,1)$

53 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 $(5,0)$

54 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 $(6,4)$

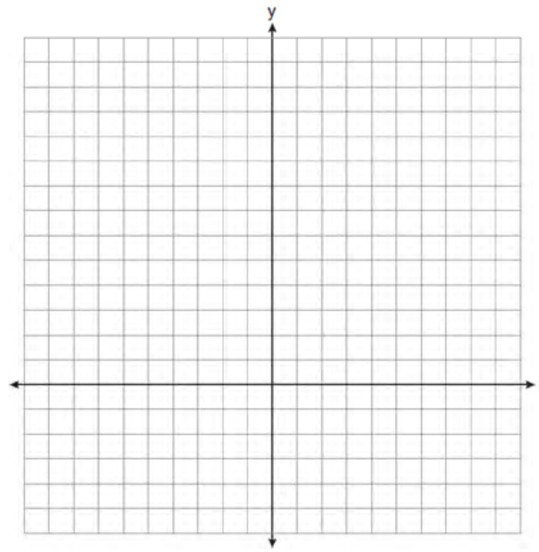
55 The equations $x^2 + y^2 = 25$ and $y = 5$ are graphed on a set of axes. What is the solution of this system?
1 $(0,0)$
2 $(5,0)$
3 $(0,5)$
4 $(5,5)$

56 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 $(6,6)$

57 On the set of axes below, solve the following system of equations graphically for all values of *x* and *y*.

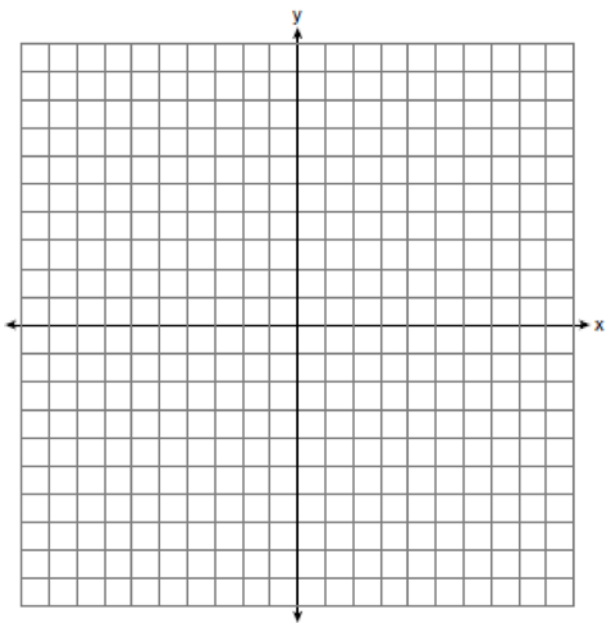
$$y = (x - 2)^2 + 4$$

$$4x + 2y = 14$$



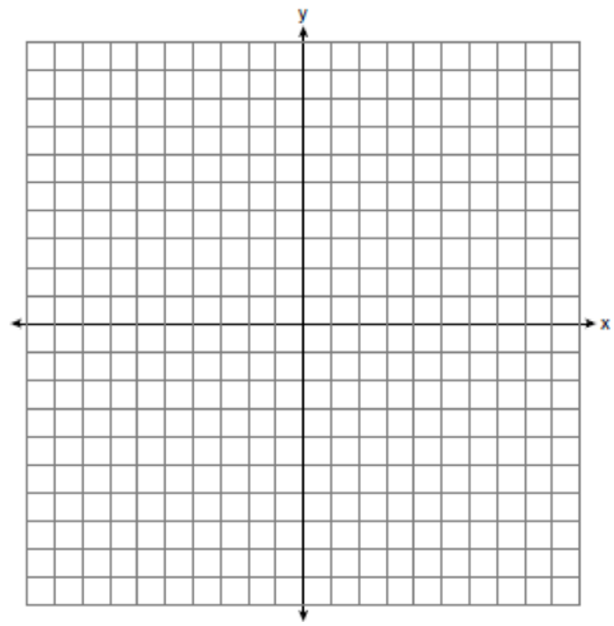
58 Solve the following system of equations graphically.

$$2x^2 - 4x = y + 1$$
$$x + y = 1$$



59 On the set of axes below, solve the system of equations graphically and state the coordinates of all points in the solution.

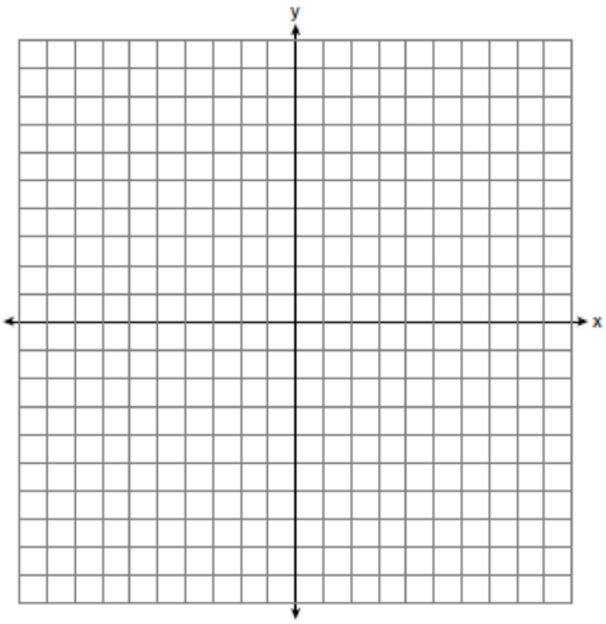
$$y = (x - 2)^2 - 3$$
$$2y + 16 = 4x$$



60 On the set of axes below, solve the following system of equations graphically and state the coordinates of *all* points in the solution.

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

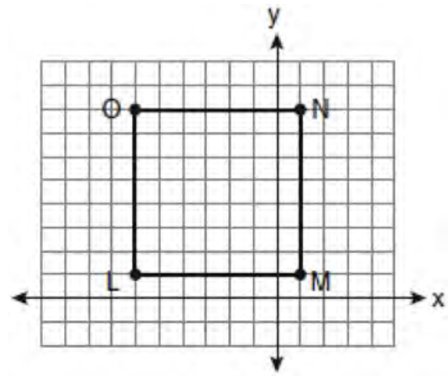
$$2y + 4 = -x$$



TOOLS OF GEOMETRY

G.G.66: MIDPOINT

61 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 $\left(-2\frac{1}{2}, 4\frac{1}{2}\right)$

62 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 $\left(3, 4\frac{1}{2}\right)$

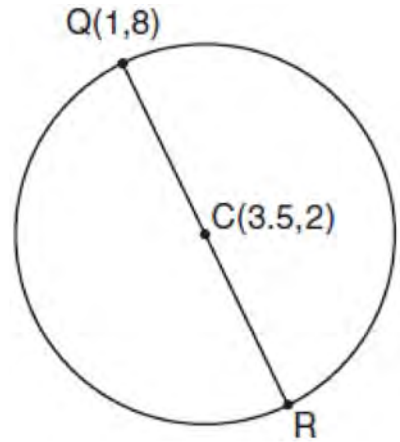
63 The endpoints of $\overline{CD}$ are $C(-2,-4)$ and $D(6,2)$. What are the coordinates of the midpoint of $\overline{CD}$?
1 $(2,3)$
2 $(2,-1)$
3 $(4,-2)$
4 $(4,3)$

64 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 $(5,-2)$

65 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 $(5.5,3)$

66 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 $(4x+4,2y)$

67 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.



68 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.

69 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 $(-5,2)$

70 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 $(-7,-2)$

71 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 $(10,10)$

G.G.67: DISTANCE

72 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

73 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 $2\sqrt{5}$

74 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

75 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 $\sqrt{145}$

76 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 $\sqrt{233}$

77 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 $2\sqrt{26}$

78 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

79 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 $\sqrt{50}$

80 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 $2\sqrt{41}$

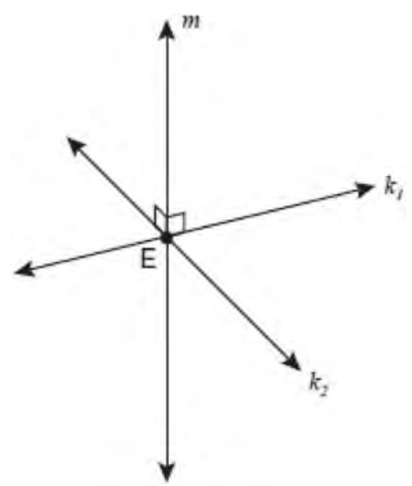
81 The endpoints of $\overline{PQ}$ are $P(-3,1)$ and $Q(4,25)$. Find the length of $\overline{PQ}$.

82 The coordinates of the endpoints of $\overline{FG}$ are $(-4,3)$ and $(2,5)$. Find the length of $\overline{FG}$ in simplest radical form.

83 Find, in simplest radical form, the length of the line segment with endpoints whose coordinates are $(-1,4)$ and $(3,-2)$.

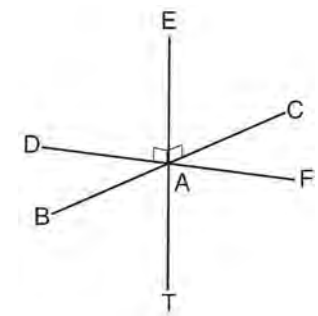
G.G.1: PLANES

84 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.

85 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.

86 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.

87 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 $\mathcal{P}$

88 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*.

89 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.

G.G.2: PLANES

90 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

91 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

92 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

G.G.3: PLANES

93 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

94 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

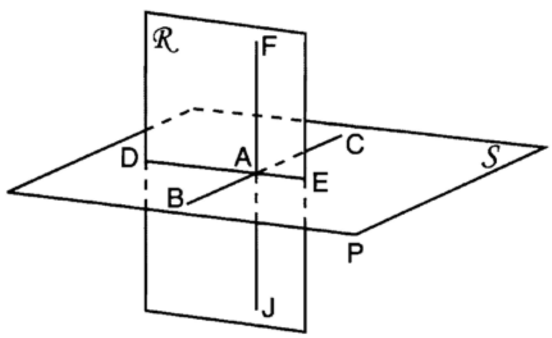
95 Point *A* lies in plane $\mathcal{B}$. How many lines can be drawn perpendicular to plane $\mathcal{B}$ through point *A*?
1 one
2 two
3 zero
4 infinite

G.G.4: PLANES

96 If two different lines are perpendicular to the same plane, they are
1 collinear
2 coplanar
3 congruent
4 consecutive

G.G.5: PLANES

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



Which fact is *not* sufficient to show that planes R and S are perpendicular?

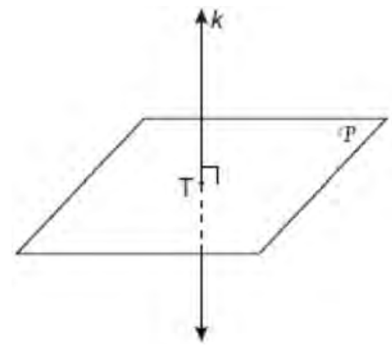
1 $\overline{FA} \perp \overline{DE}$
2 $\overline{AD} \perp \overline{AF}$
3 $\overline{BC} \perp \overline{FJ}$
4 $\overline{DE} \perp \overline{BC}$

98 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 $\mathcal{R}$.

G.G.7: PLANES

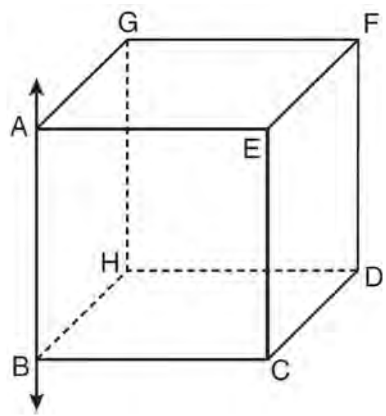
99 In the diagram below, line k is perpendicular to plane $\mathcal{P}$ at point T.



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 $\mathcal{P}$.

100 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*

G.G.8: PLANES

101 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

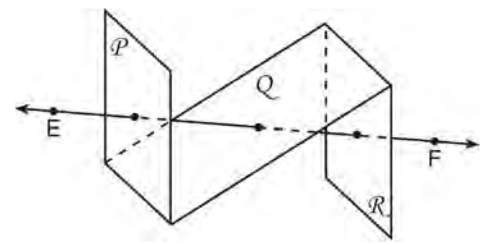
1 plane
2 point
3 pair of parallel lines
4 pair of intersecting lines

102 Plane $\mathcal{A}$ is parallel to plane $\mathcal{B}$. Plane $\mathcal{C}$ 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

G.G.9: PLANES

103 As shown in the diagram below, $\overleftrightarrow{EF}$ intersects planes $\mathcal{P}$, $\mathcal{Q}$, 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 $\mathcal{Q}$.
2 Plane $\mathcal{R}$ is perpendicular to plane $\mathcal{P}$.
3 Plane $\mathcal{P}$ is parallel to plane $\mathcal{Q}$.
4 Plane $\mathcal{R}$ is parallel to plane $\mathcal{P}$.

104 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*.

105 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

106 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 $\mathcal{D}$.

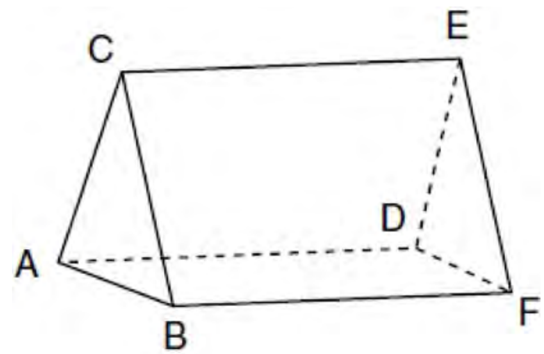
107 If two distinct planes, $\mathcal{A}$ and $\mathcal{B}$, are perpendicular to line c, then which statement is true?
1 Planes $\mathcal{A}$ and $\mathcal{B}$ are parallel to each other.
2 Planes $\mathcal{A}$ and $\mathcal{B}$ are perpendicular to each other.
3 The intersection of planes $\mathcal{A}$ 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.

108 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.

109 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

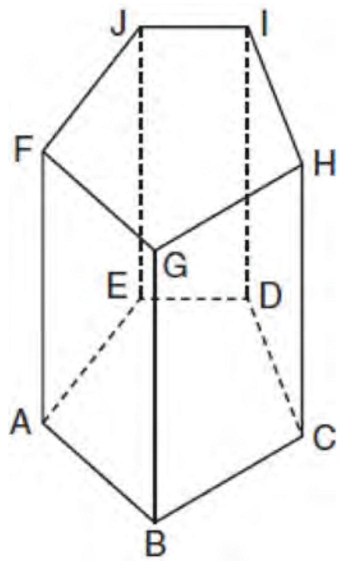
G.G.10: SOLIDS

110 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 $\overline{DE} \parallel \overline{BC}$

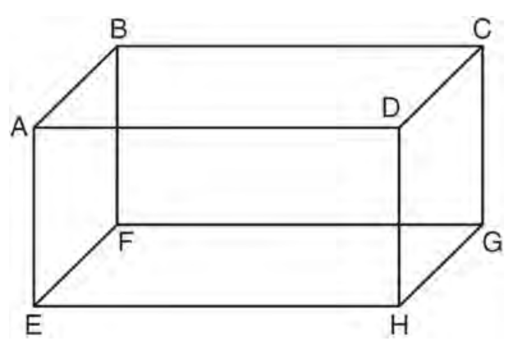
111 The diagram below shows a right pentagonal prism.



Which statement is always true?

1 $\overline{BC} \parallel \overline{ED}$
2 $\overline{FG} \parallel \overline{CD}$
3 $\overline{FJ} \parallel \overline{IH}$
4 $\overline{GB} \parallel \overline{HC}$

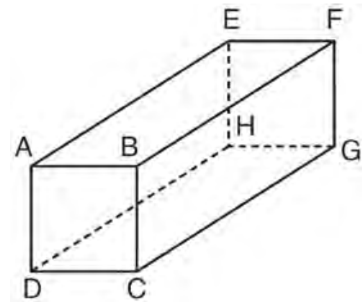
112 The diagram below shows a rectangular prism.



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 $\overline{EF}$

113 The diagram below represents a rectangular solid.



Which statement must be true?

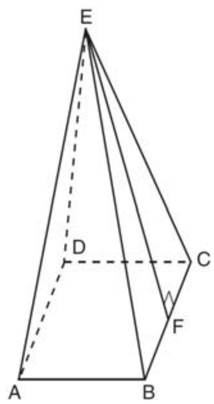
1 $\overline{EH}$ and $\overline{BC}$ are coplanar
2 $\overline{FG}$ and $\overline{AB}$ are coplanar
3 $\overline{EH}$ and $\overline{AD}$ are skew
4 $\overline{FG}$ and $\overline{CG}$ are skew

114 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

G.G.13: SOLIDS

115 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?

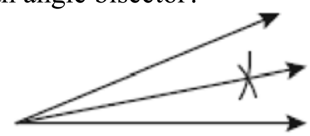
1 $\overline{EA} \cong \overline{EC}$
2 $\overline{EB} \cong \overline{EF}$
3 $\triangle AEB \cong \triangle BEC$
4 $\triangle CED$ is isosceles

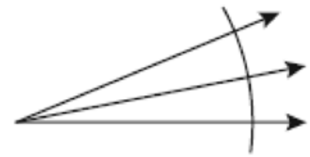
116 The lateral faces of a regular pyramid are composed of

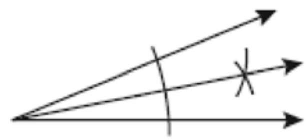
1 squares
2 rectangles
3 congruent right triangles
4 congruent isosceles triangles

G.G.17: CONSTRUCTIONS

117 Which illustration shows the correct construction of an angle bisector?

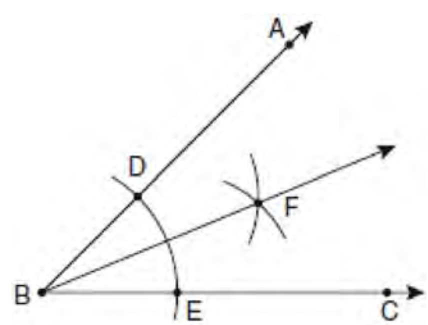
1 

2 

3 

4 

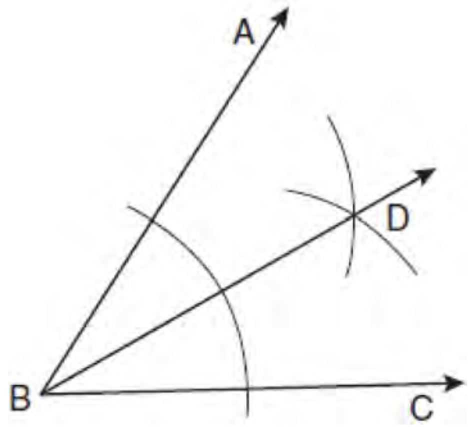
118 The diagram below shows the construction of the bisector of $\angle ABC$.



Which statement is *not* true?

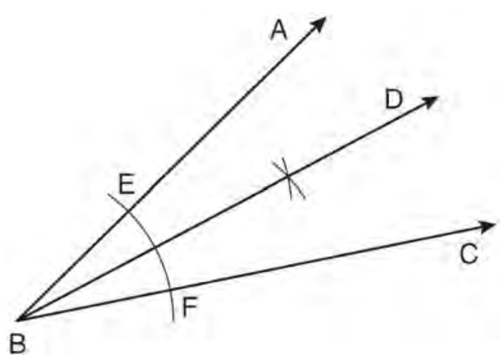
1 $m\angle EBF = \frac{1}{2} m\angle ABC$
2 $m\angle DBF = \frac{1}{2} m\angle ABC$
3 $m\angle EBF = m\angle ABC$
4 $m\angle DBF = m\angle EBF$

119 Based on the construction below, which statement must be true?



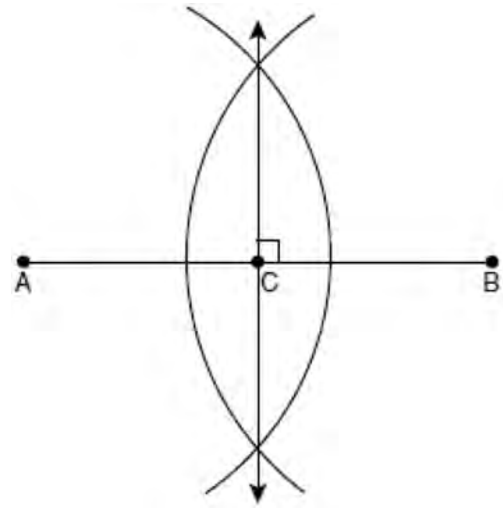
1 $m\angle ABD = \frac{1}{2} m\angle CBD$
2 $m\angle ABD = m\angle CBD$
3 $m\angle ABD = m\angle ABC$
4 $m\angle CBD = \frac{1}{2} m\angle ABD$

120 .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*.



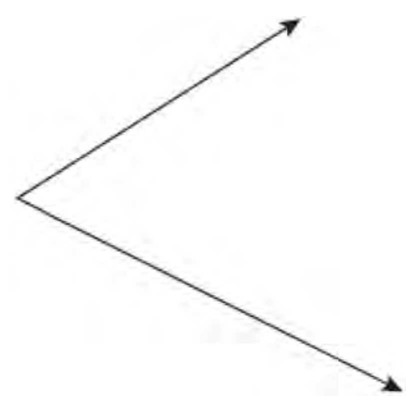
Which statement is *false*?
1 $m\angle ABD = m\angle DBC$
2 $\frac{1}{2}(m\angle ABC) = m\angle ABD$
3 $2(m\angle DBC) = m\angle ABC$
4 $2(m\angle ABC) = m\angle CBD$

121 The diagram below shows the construction of the perpendicular bisector of $\overline{AB}$.

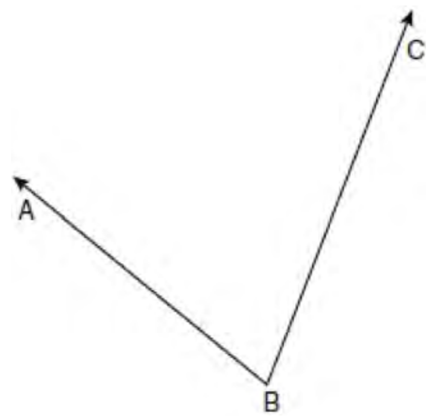


Which statement is *not* true?
1 $AC = CB$
2 $CB = \frac{1}{2} AB$
3 $AC = 2AB$
4 $AC + CB = AB$

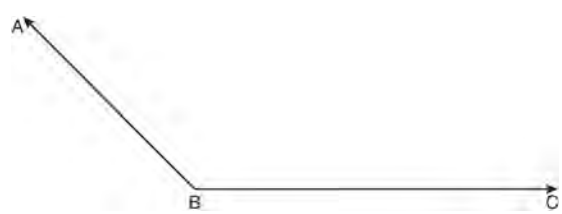
122 Using a compass and straightedge, construct the bisector of the angle shown below. [*Leave all construction marks*.]



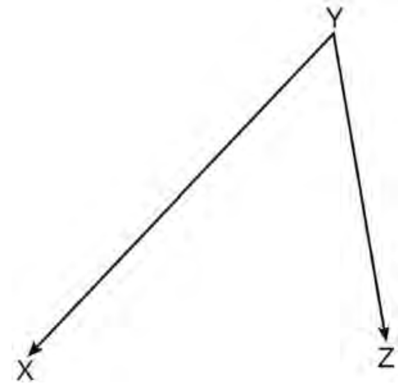
123 Using a compass and straightedge, construct the angle bisector of $\angle ABC$ shown below. [Leave all construction marks.]



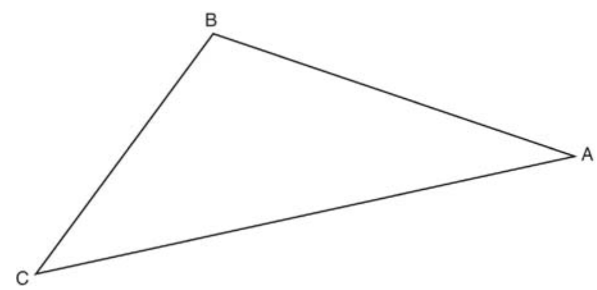
124 On the diagram below, use a compass and straightedge to construct the bisector of $\angle ABC$. [Leave all construction marks.]



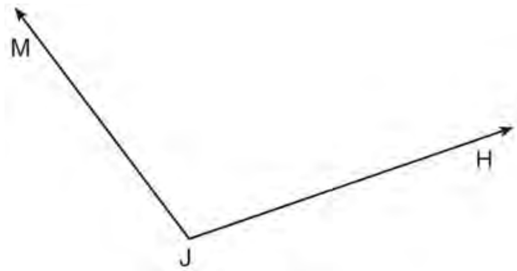
125 On the diagram below, use a compass and straightedge to construct the bisector of $\angle XYZ$. [Leave all construction marks.]



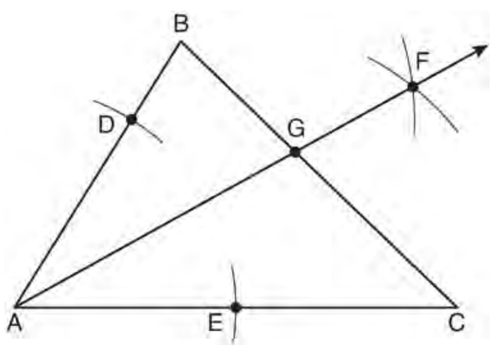
126 Using a compass and straightedge, construct the bisector of $\angle CBA$. [Leave all construction marks.]



127 Using a compass and straightedge, construct the bisector of $\angle MJH$. [Leave all construction marks.]



128 As shown in the diagram below of ΔABC, 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 ΔABC, is labeled.

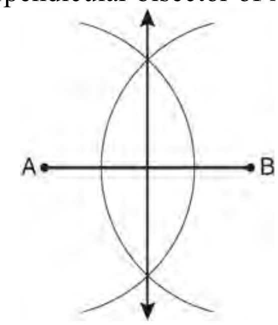


Which statement must be true?

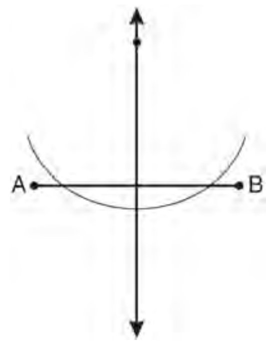
1 $\overrightarrow{AF}$ bisects side $\overline{BC}$
2 $\overrightarrow{AF}$ bisects $\angle BAC$
3 $\overrightarrow{AF} \perp \overline{BC}$
4 $\Delta ABG \sim \Delta ACG$

G.G.18: CONSTRUCTIONS

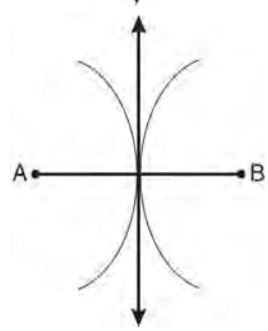
129 Which diagram shows the construction of the perpendicular bisector of $\overline{AB}$?



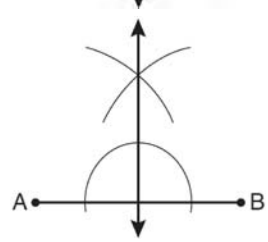
1



2

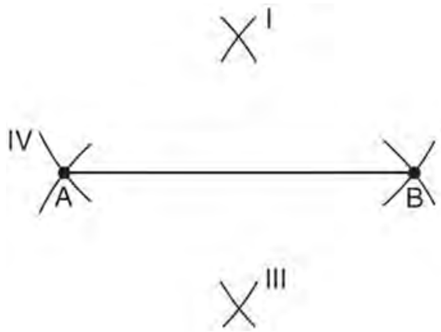


3



4

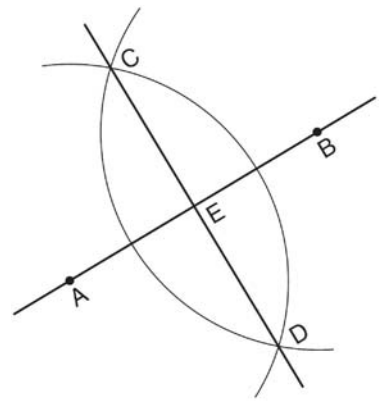
130 Line segment AB is shown in the diagram below.



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

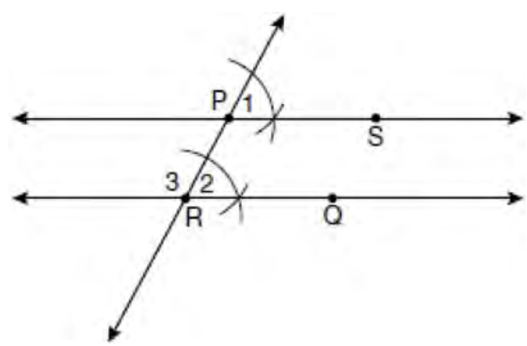
131 One step in a construction uses the endpoints of $\overline{AB}$ to create arcs with the same radii. The arcs intersect above and below the segment. What is the relationship of $\overline{AB}$ and the line connecting the points of intersection of these arcs?
1 collinear
2 congruent
3 parallel
4 perpendicular

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



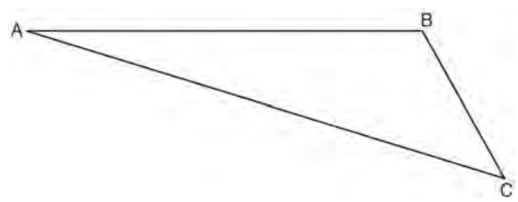
1 $\overline{AB} \perp \overline{CD}$
2 $AB = CD$
3 $AE = EB$
4 $CE = DE$

133 The diagram below illustrates the construction of $\overleftrightarrow{PS}$ parallel to $\overleftrightarrow{RQ}$ through point P.



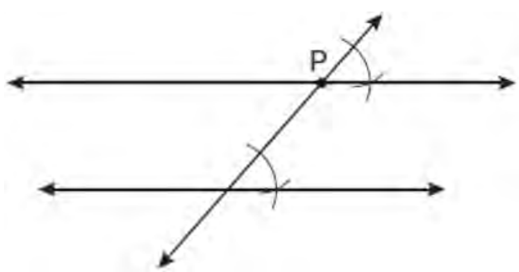
Which statement justifies this construction?
1 $m\angle 1 = m\angle 2$
2 $m\angle 1 = m\angle 3$
3 $\overline{PR} \cong \overline{RQ}$
4 $\overline{PS} \cong \overline{RQ}$

134 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.]



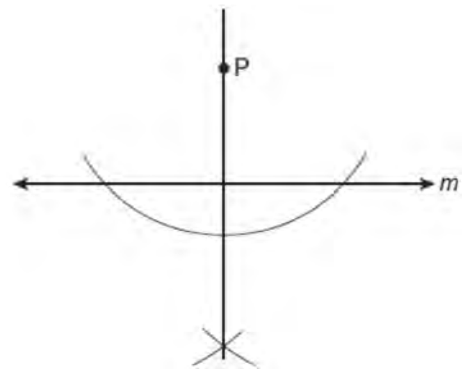
G.G.19: CONSTRUCTIONS

135 Which geometric principle is used to justify the construction below?



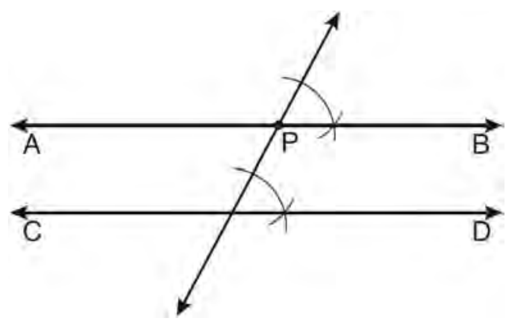
1 A line perpendicular to one of two parallel lines is perpendicular to the other.
2 Two lines are perpendicular if they intersect to form congruent adjacent angles.
3 When two lines are intersected by a transversal and alternate interior angles are congruent, the lines are parallel.
4 When two lines are intersected by a transversal and the corresponding angles are congruent, the lines are parallel.

136 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.

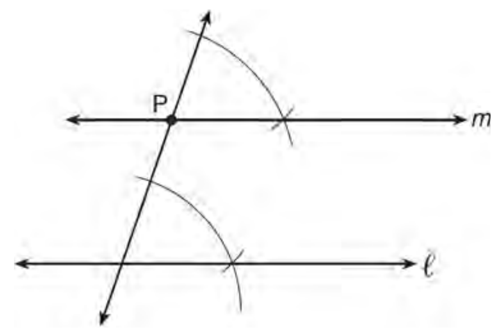
137 The diagram below shows the construction of $\overleftrightarrow{AB}$ through point P parallel to $\overleftrightarrow{CD}$.



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.

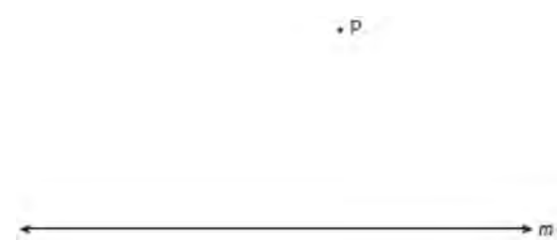
138 The diagram below shows the construction of line m, parallel to line ℓ, through point P.



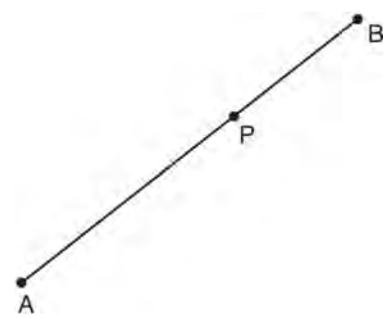
Which theorem was used to justify this construction?

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.

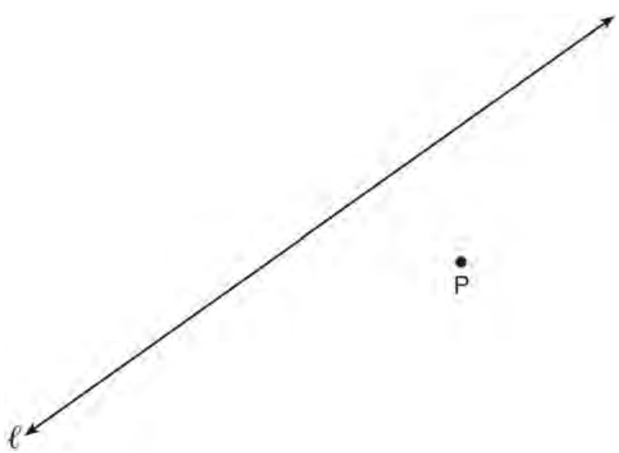
139 Using a compass and straightedge, construct a line that passes through point P and is perpendicular to line m. [Leave all construction marks.]



140 Using a compass and straightedge, construct a line perpendicular to $\overline{AB}$ through point P. [Leave all construction marks.]

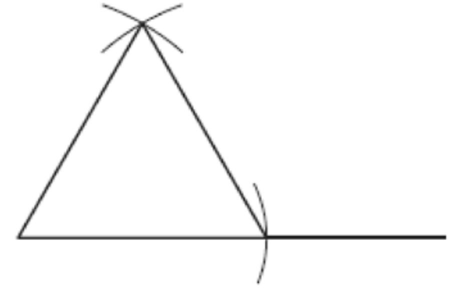


141 Using a compass and straightedge, construct a line perpendicular to line ℓ through point P. [Leave all construction marks.]

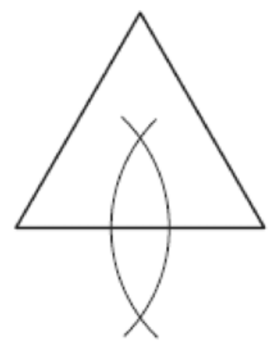


G.G.20: CONSTRUCTIONS

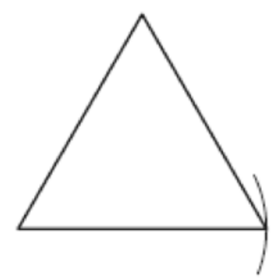
142 Which diagram shows the construction of an equilateral triangle?



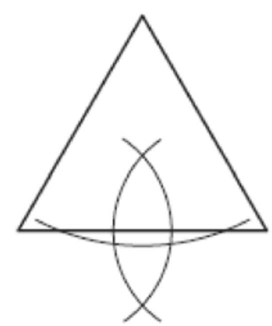
1



2

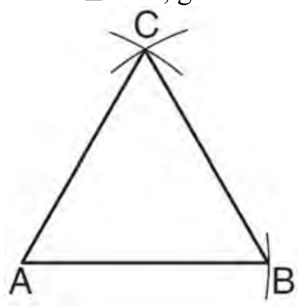


3

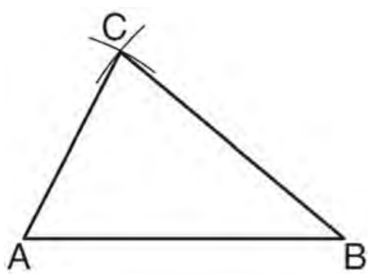


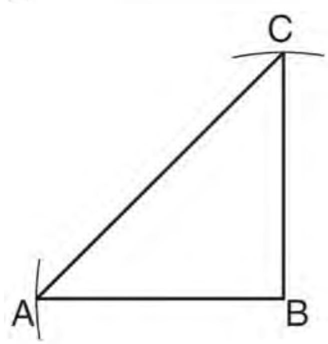
4

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

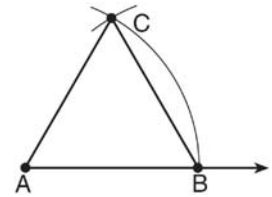
1 

2 

3 

4 

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



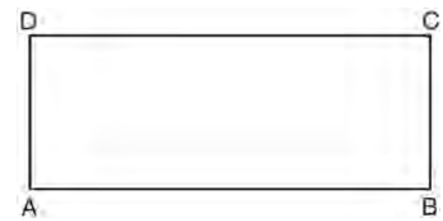
Which statement justifies this construction?
1 $\angle A + \angle B + \angle C = 180$
2 $m\angle A = m\angle B = m\angle C$
3 $AB = AC = BC$
4 $AB + BC > AC$

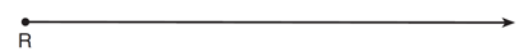
145 On the line segment below, use a compass and straightedge to construct equilateral triangle *ABC*. [Leave all construction marks.]

146 Using a compass and straightedge, and $\overline{AB}$ below, construct an equilateral triangle with all sides congruent to $\overline{AB}$. [Leave all construction marks.]

147 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.]

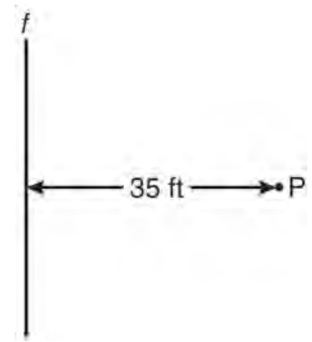
148 On the ray drawn below, using a compass and straightedge, construct an equilateral triangle with a vertex at *R*. The length of a side of the triangle must be equal to a length of the diagonal of rectangle *ABCD*.





G.G.22: LOCUS

149 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.



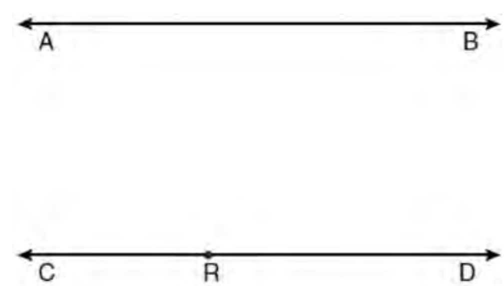
How many locations are possible for the bird bath?
1 1
2 2
3 3
4 0

150 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

151 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

152 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

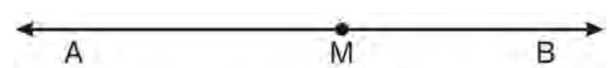
153 Two lines, $\overleftrightarrow{AB}$ and $\overleftrightarrow{CRD}$, are parallel and 10 inches apart. Sketch the locus of all points that are equidistant from $\overleftrightarrow{AB}$ and $\overleftrightarrow{CRD}$ and 7 inches from point *R*. Label with an **X** each point that satisfies both conditions.



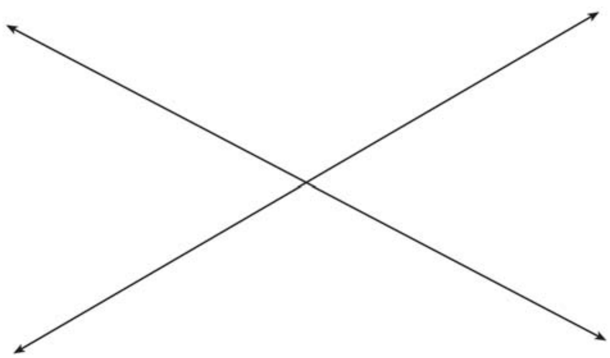
154 The length of $\overline{AB}$ is 3 inches. On the diagram below, sketch the points that are equidistant from *A* and *B* and sketch the points that are 2 inches from A. Label with an **X** all points that satisfy both conditions.

155 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.

156 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.



157 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.



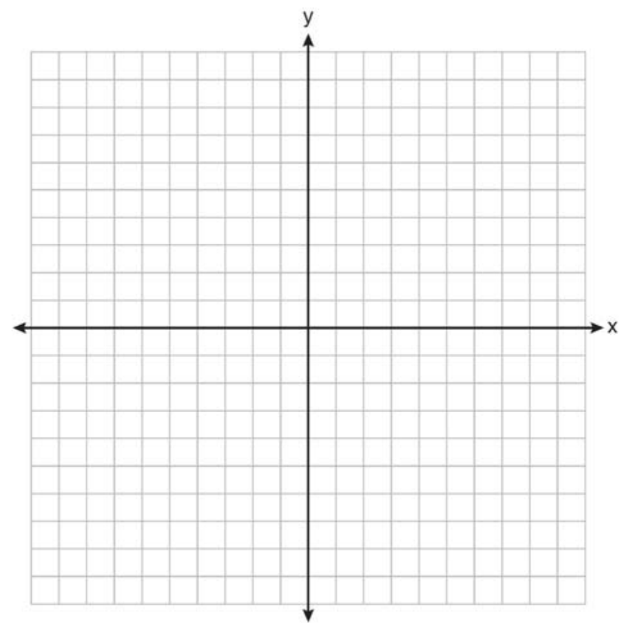
G.G.23: LOCUS

158 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

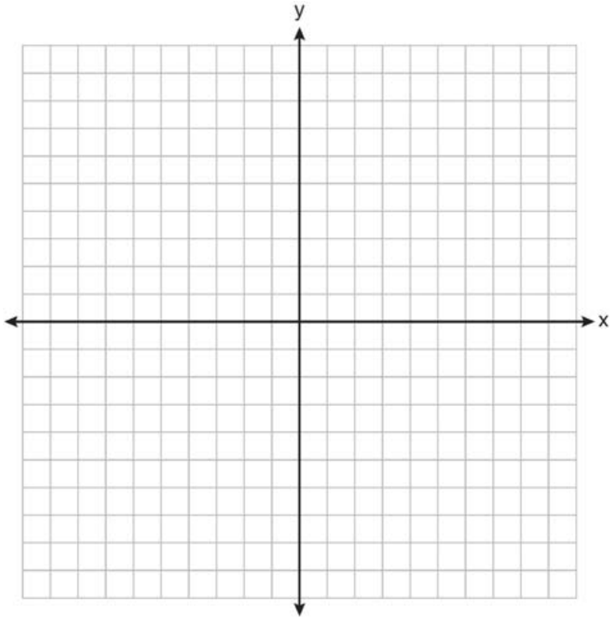
159 In a coordinate plane, how many points are both 5 units from the origin and 2 units from the x-axis?
1 1
2 2
3 3
4 4

160 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

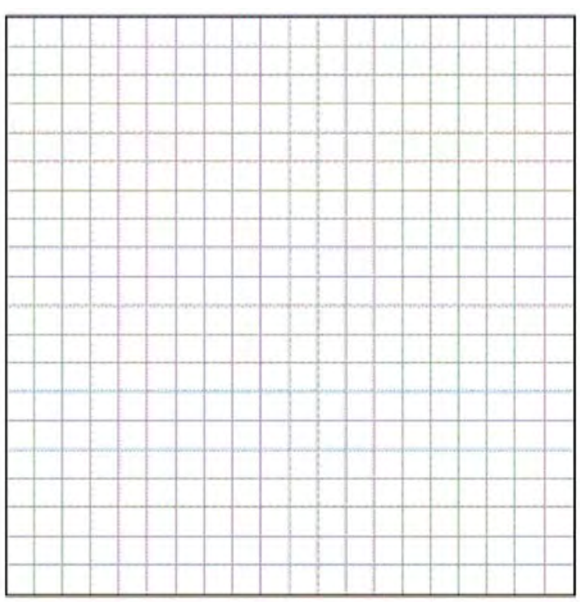
161 A city is planning to build a new park. The park must be equidistant from school A at $(3,3)$ and school B at $(3,-5)$. The park also must be exactly 5 miles from the center of town, which is located at the origin on the coordinate graph. Each unit on the graph represents 1 mile. On the set of axes below, sketch the compound loci and label with an **X** all possible locations for the new park.



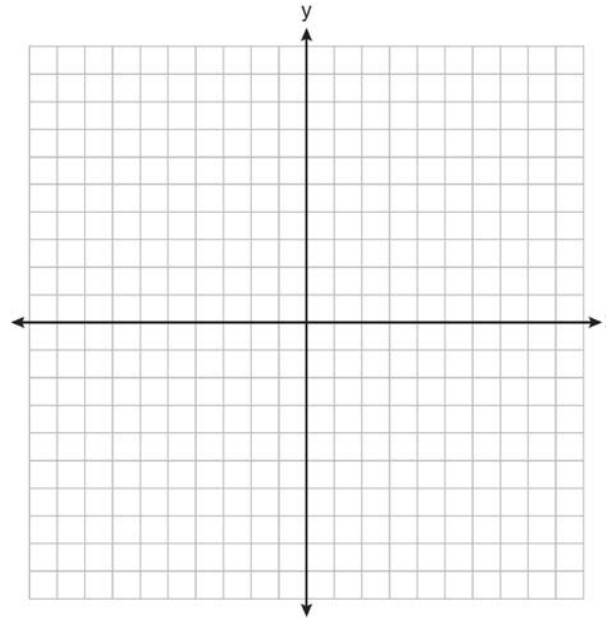
162 On the set of axes below, sketch the points that are 5 units from the origin and sketch the points that are 2 units from the line $y = 3$. Label with an **X** all points that satisfy both conditions.



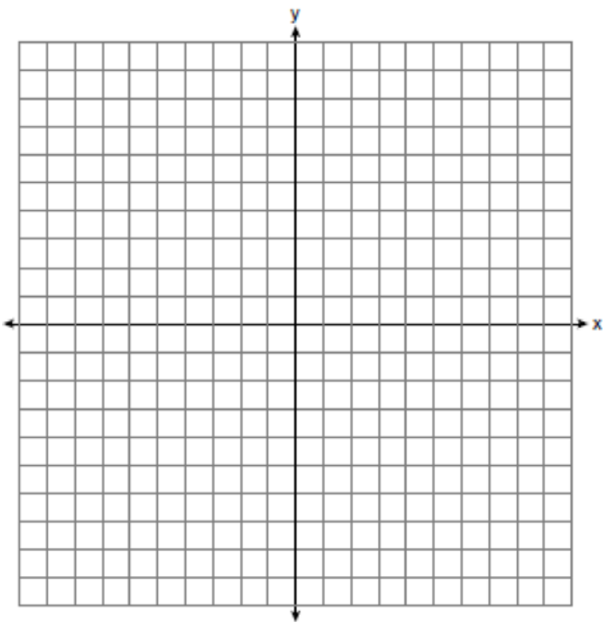
163 On the grid below, graph the points that are equidistant from both the x and y axes and the points that are 5 units from the origin. Label with an **X** all points that satisfy *both* conditions.



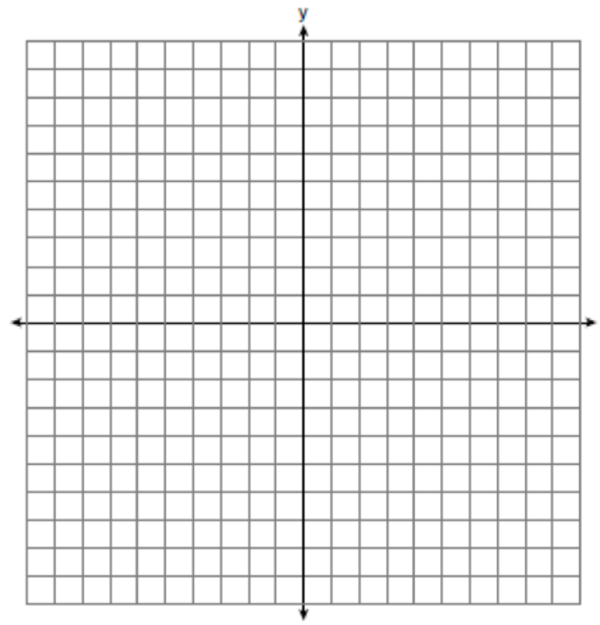
164 On the set of axes below, graph the locus of points that are four units from the point $(2, 1)$. On the same set of axes, graph the locus of points that are two units from the line $x = 4$. State the coordinates of all points that satisfy both conditions.



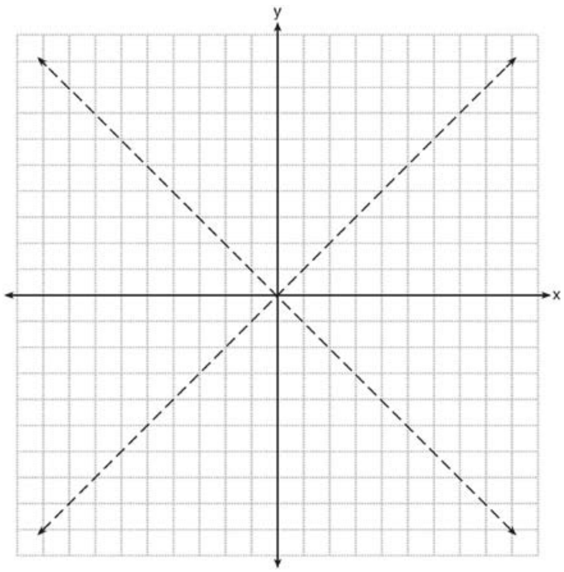
165 On the set of coordinate axes below, graph the locus of points that are equidistant from the lines $y = 6$ and $y = 2$ and also graph the locus of points that are 3 units from the y-axis. State the coordinates of *all* points that satisfy *both* conditions.



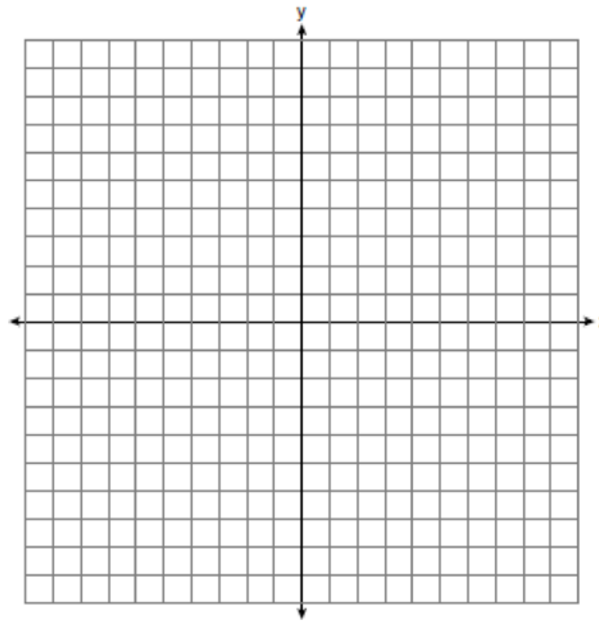
166 On the set of axes below, graph the locus of points that are 4 units from the line $x = 3$ and the locus of points that are 5 units from the point $(0, 2)$. Label with an **X** all points that satisfy both conditions.



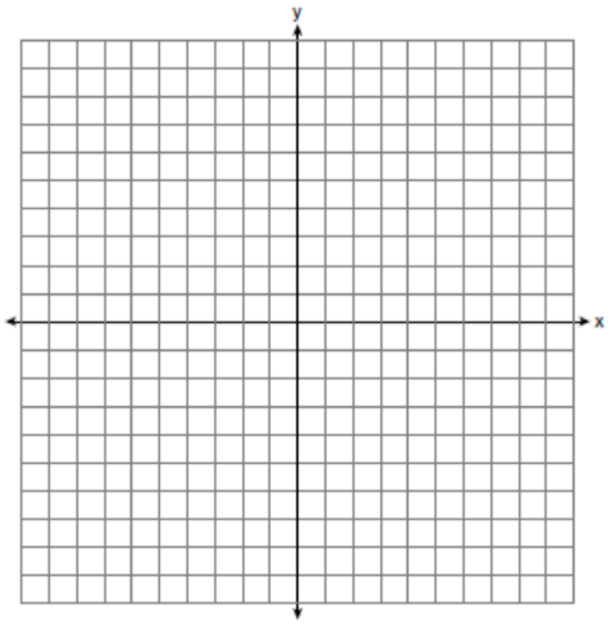
167 The graph below shows the locus of points equidistant from the x-axis and y-axis. On the same set of axes, graph the locus of points 3 units from the line $x = 0$. Label with an **X** *all* points that satisfy both conditions.



168 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.



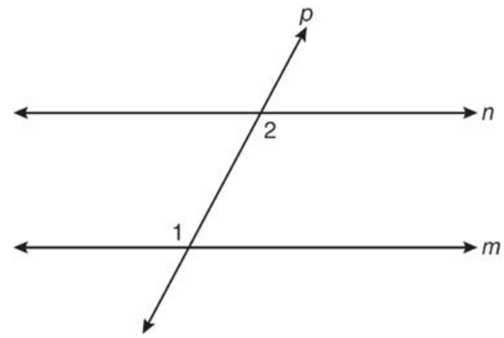
169 On the set of axes below, graph the locus of points 4 units from the x-axis and equidistant from the points whose coordinates are $(-2, 0)$ and $(8, 0)$. Mark with an **X** all points that satisfy *both* conditions.



ANGLES

G.G.35: PARALLEL LINES & TRANSVERSALS

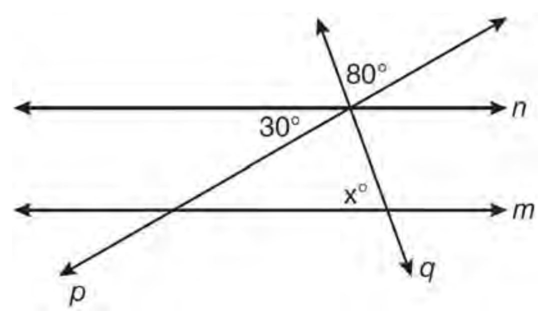
170 In the diagram below, line p intersects line m and line n.



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

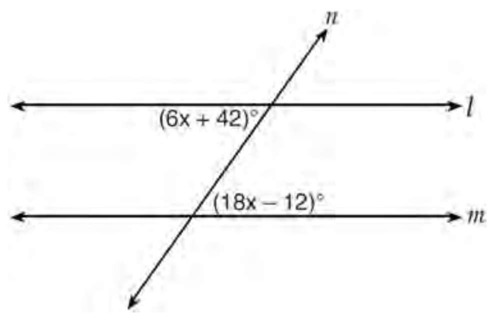
171 In the diagram below, lines n and m are cut by transversals p and q.



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

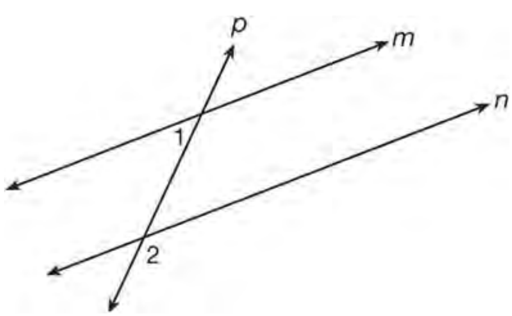
1 110
2 80
3 70
4 50

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



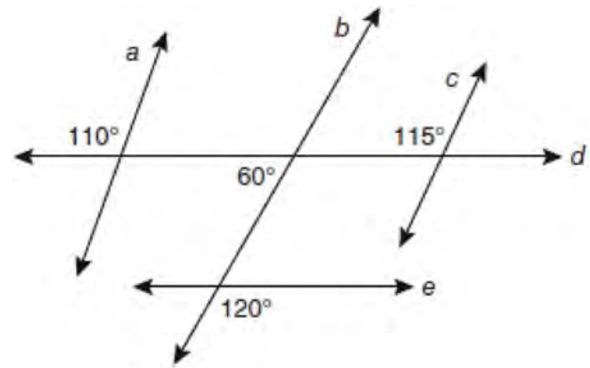
Which value of x would prove $l \parallel m$?
1 2.5
2 4.5
3 6.25
4 8.75

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



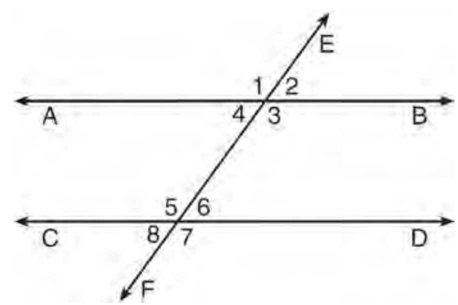
If $m\angle 1 = 4x + 14$ and $m\angle 2 = 8x + 10$, lines m and n are parallel when x equals
1 1
2 6
3 13
4 17

174 Based on the diagram below, which statement is true?



1 $a \parallel b$
2 $a \parallel c$
3 $b \parallel c$
4 $d \parallel e$

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

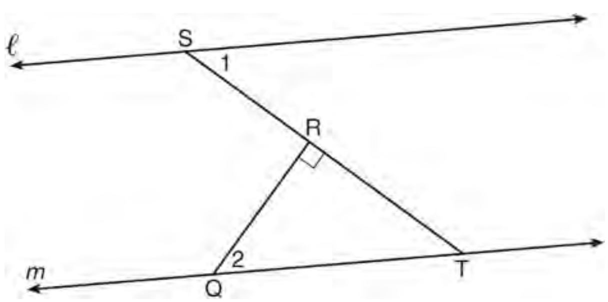


Which statement could always be used to prove $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$?
1 $\angle 2 \cong \angle 4$
2 $\angle 7 \cong \angle 8$
3 $\angle 3$ and $\angle 6$ are supplementary
4 $\angle 1$ and $\angle 5$ are supplementary

176 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.

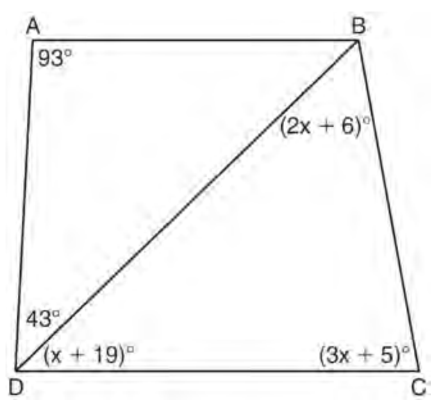
Geometry Regents Exam Questions by Performance Indicator: Topic

177 In the diagram below, $\ell \parallel m$ and $\overline{QR} \perp \overline{ST}$ at R.



If m∠1 = 63, find m∠2.

178 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.



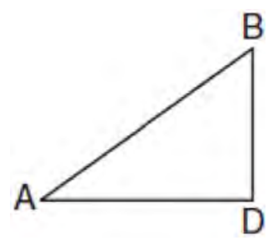
TRIANGLES

G.G.48: PYTHAGOREAN THEOREM

179 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 $\{15, 36, 39\}$

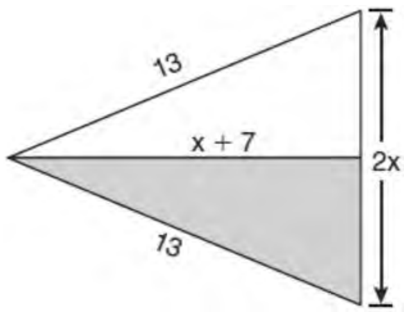
180 Which set of numbers could *not* represent the lengths of the sides of a right triangle?
1 $\{1, 3, \sqrt{10}\}$
2 $\{2, 3, 4\}$
3 $\{3, 4, 5\}$
4 $\{8, 15, 17\}$

181 In the diagram below of $\triangle ADB$, $m\angle BDA = 90$, $AD = 5\sqrt{2}$, and $AB = 2\sqrt{15}$.



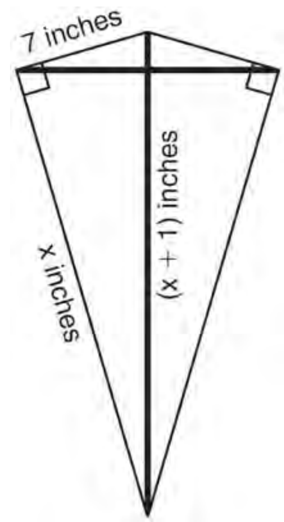
What is the length of $\overline{BD}$?
1 $\sqrt{10}$
2 $\sqrt{20}$
3 $\sqrt{50}$
4 $\sqrt{110}$

182 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

183 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

G.G.30: INTERIOR AND EXTERIOR ANGLES OF TRIANGLES

184 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°

185 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°

186 In ΔABC, $m\angle A = x$, $m\angle B = 2x + 2$, and $m\angle C = 3x + 4$. What is the value of x?
1 29
2 31
3 59
4 61

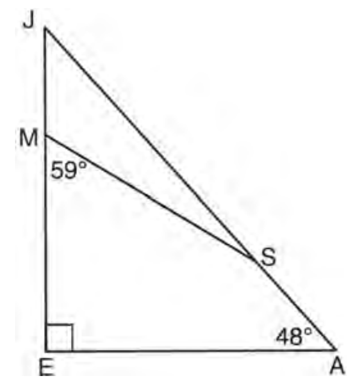
187 In ΔDEF, $m\angle D = 3x + 5$, $m\angle E = 4x - 15$, and $m\angle F = 2x + 10$. Which statement is true?
1 $DF = FE$
2 $DE = FE$
3 $m\angle E = m\angle F$
4 $m\angle D = m\angle F$

188 Triangle PQR has angles in the ratio of $2:3:5$. Which type of triangle is ΔPQR?
1 acute
2 isosceles
3 obtuse
4 right

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

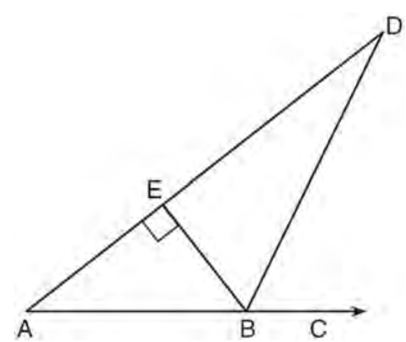
190 The angles of triangle ABC are in the ratio of $8:3:4$. What is the measure of the *smallest* angle?
1 12º
2 24º
3 36º
4 72º

191 In the diagram of ΔJEA 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

192 The diagram below shows ΔABD, with $\overrightarrow{ABC}$, $\overline{BE} \perp \overline{AD}$, and $\angle EBD \cong \angle CBD$.



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

193 The degree measures of the angles of ΔABC are represented by x, $3x$, and $5x - 54$. Find the value of x.

194 In right $\triangle DEF$, $m\angle D = 90$ and $m\angle F$ is 12 degrees less than twice $m\angle E$. Find $m\angle E$.

195 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.

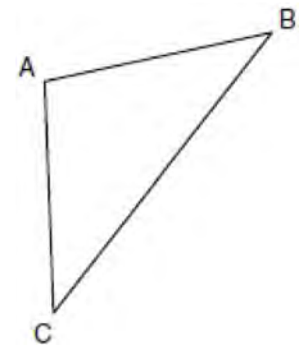
G.G.31: ISOSCELES TRIANGLE THEOREM

196 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 $\overline{AD} \cong \overline{DC}$

197 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 $m\angle C < m\angle B$

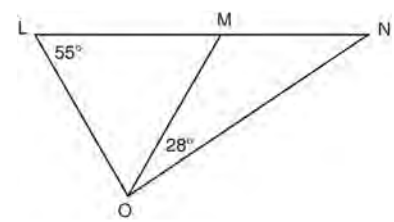
198 If the vertex angles of two isosceles triangles are congruent, then the triangles must be
1 acute
2 congruent
3 right
4 similar

199 In the diagram of $\triangle ABC$ below, $\overline{AB} \cong \overline{AC}$. The measure of $\angle B$ is 40°.



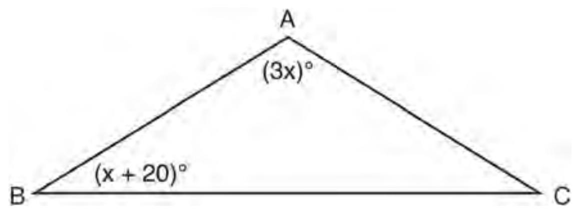
What is the measure of $\angle A$?
1 40°
2 50°
3 70°
4 100°

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



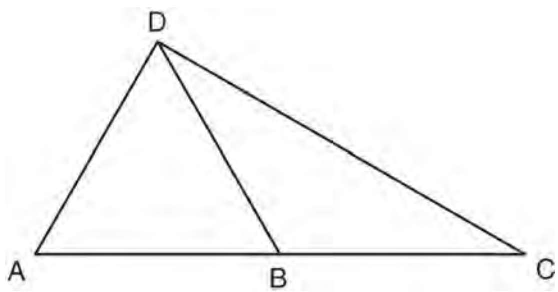
If $m\angle L = 55$ and $m\angle NOM = 28$, what is $m\angle N$?
1 27
2 28
3 42
4 70

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

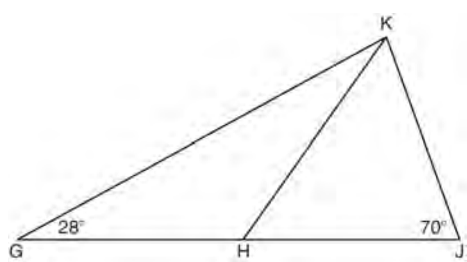


What is the value of x?
1 10
2 28
3 32
4 40

202 In the diagram below of ΔACD, B is a point on $\overline{AC}$ such that ΔADB is an equilateral triangle, and ΔDBC is an isosceles triangle with $\overline{DB} \cong \overline{BC}$. Find $m\angle C$.



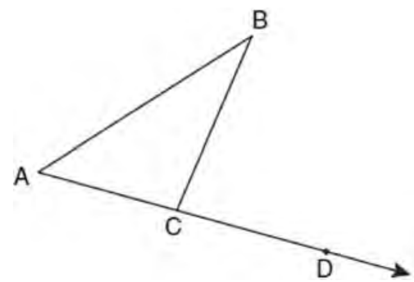
203 In the diagram below of ΔGJK, H is a point on $\overline{GJ}$, $\overline{HJ} \cong \overline{JK}$, $m\angle G = 28$, and $m\angle GJK = 70$. Determine whether ΔGHK is an isosceles triangle and justify your answer.



204 In ΔRST, $m\angle RST = 46$ and $\overline{RS} \cong \overline{ST}$. Find $m\angle STR$.

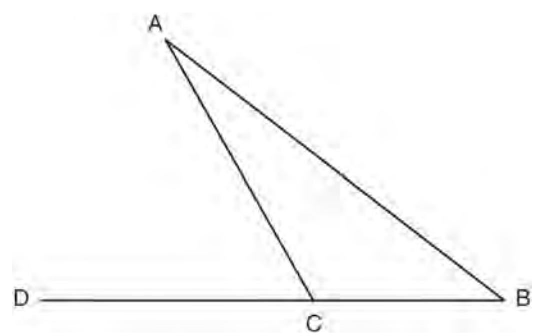
G.G.32: EXTERIOR ANGLE THEOREM

205 In the diagram below, ΔABC is shown with $\overline{AC}$ extended through point D.



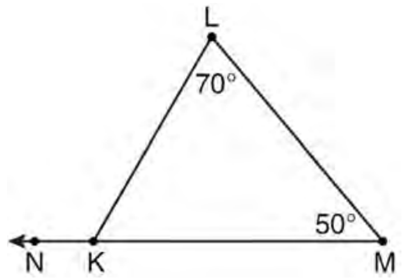
If $m\angle BCD = 6x + 2$, $m\angle BAC = 3x + 15$, and $m\angle ABC = 2x - 1$, what is the value of x?
1 12
2 $14\frac{10}{11}$
3 16
4 $18\frac{1}{9}$

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



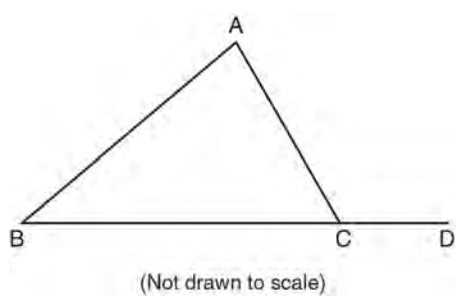
What is $m\angle B$?
1 5
2 20
3 25
4 55

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



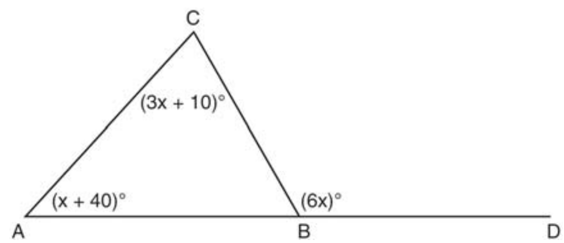
What is the measure of $\angle LKN$?
1 60º
2 120º
3 180º
4 300º

208 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

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

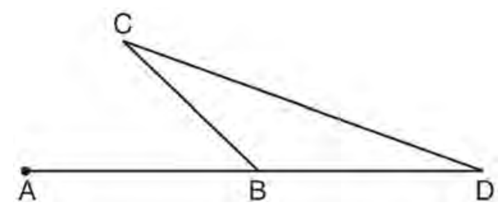


If $m\angle CAB = x + 40$, $m\angle ACB = 3x + 10$, $m\angle CBD = 6x$, what is $m\angle CAB$?
1 13
2 25
3 53
4 65

210 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

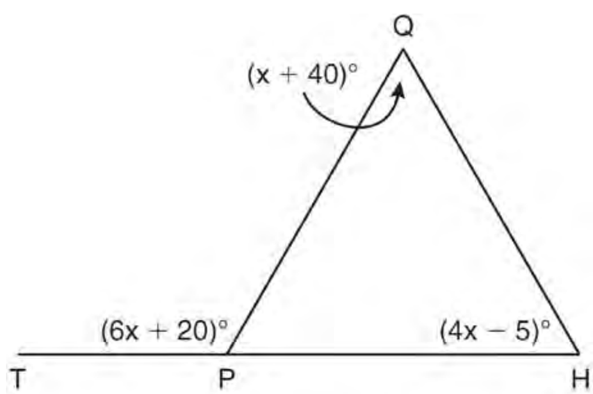
211 Side $\overline{PQ}$ of $\triangle PQR$ is extended through Q to point T. Which statement is *not* always true?
1 $m\angle RQT > m\angle R$
2 $m\angle RQT > m\angle P$
3 $m\angle RQT = m\angle P + m\angle R$
4 $m\angle RQT > m\angle PQR$

212 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 $m\angle ABC > m\angle C + m\angle D$

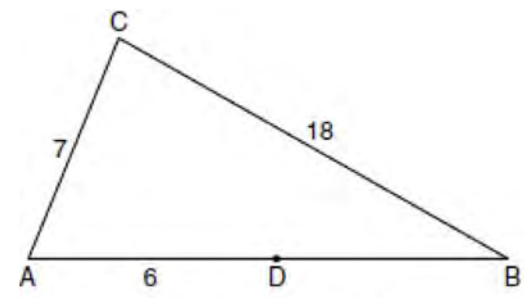
213 In the diagram below of $\triangle HQP$, side $\overline{HP}$ is extended through P to T, $m\angle QPT = 6x + 20$, $m\angle HQP = x + 40$, and $m\angle PHQ = 4x - 5$. Find $m\angle QPT$.



(Not drawn to scale)

G.G.33: TRIANGLE INEQUALITY THEOREM

214 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

215 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 $\{26, 8, 15\}$

216 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 $3 < AC < 7$

G.G.34: ANGLE SIDE RELATIONSHIP

217 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 $BC < AC < AB$

218 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 $m\angle P > m\angle R > m\angle Q$

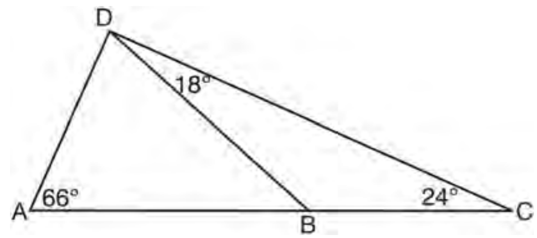
219 In $\triangle ABC$, $AB = 7$, $BC = 8$, and $AC = 9$. Which list has the angles of $\triangle ABC$ in order from smallest to largest?

1 $\angle A, \angle B, \angle C$
2 $\angle B, \angle A, \angle C$
3 $\angle C, \angle B, \angle A$
4 $\angle C, \angle A, \angle B$

220 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 $\overline{BC}, \overline{AB}, \overline{AC}$

221 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 $\overline{BD}$

222 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 $BC < BA$

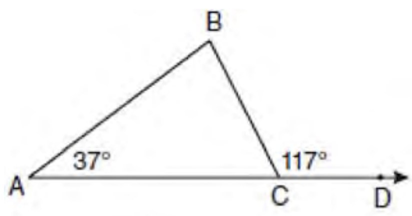
223 In $\triangle RST$, $m\angle R = 58$ and $m\angle S = 73$. Which inequality is true?

1 $RT < TS < RS$
2 $RS < RT < TS$
3 $RT < RS < TS$
4 $RS < TS < RT$

224 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.

225 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.

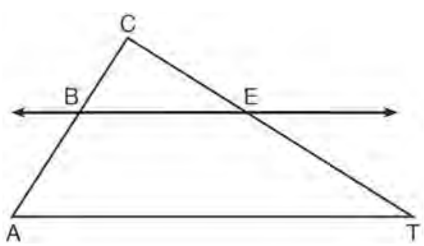


(Not drawn to scale)

226 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 $\triangle ABC$.

G.G.46: SIDE SPLITTER THEOREM

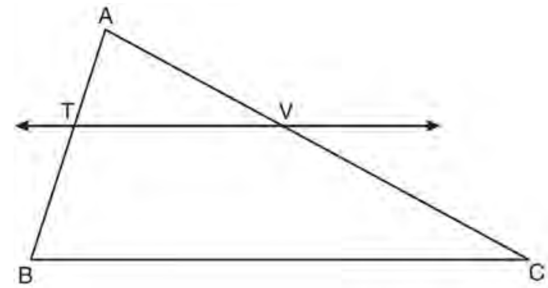
227 In the diagram below of $\triangle ACT$, $\overleftrightarrow{BE} \parallel \overline{AT}$.



If $CB = 3$, $CA = 10$, and $CE = 6$, what is the length of $\overline{ET}$?

1 5
2 14
3 20
4 26

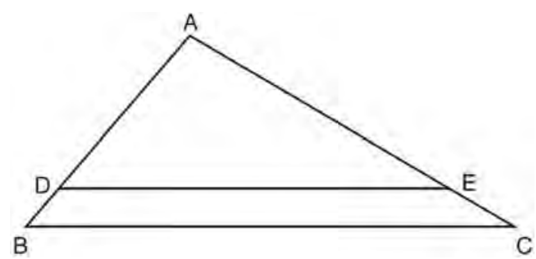
228 In the diagram below of $\triangle ABC$, $\overleftrightarrow{TV} \parallel \overline{BC}$, $AT = 5$, $TB = 7$, and $AV = 10$.



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

1 $3\frac{1}{2}$
2 $7\frac{1}{7}$
3 14
4 24

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

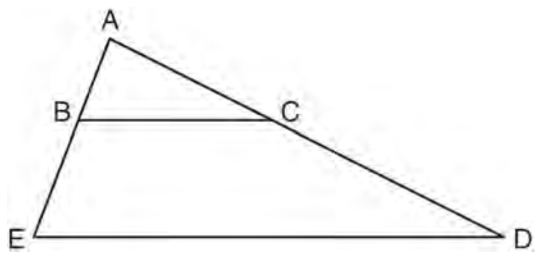


If $AB = 10$, $AD = 8$, and $AE = 12$, what is the length of $\overline{EC}$?

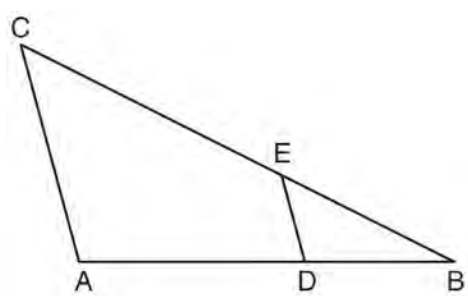
1 6
2 2
3 3
4 15

230 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

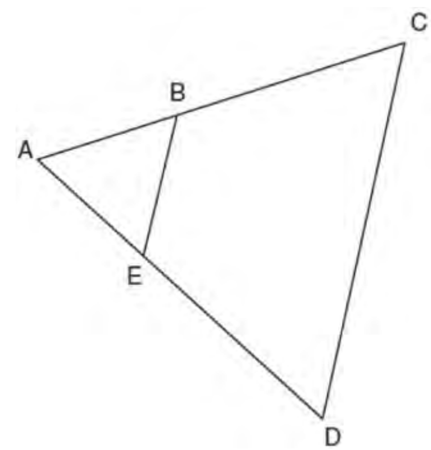
231 In the diagram below of $\triangle ADE$, B is a point on $\overline{AE}$ and C is a point on $\overline{AD}$ such that $\overline{BC} \parallel \overline{ED}$, $AC = x - 3$, $BE = 20$, $AB = 16$, and $AD = 2x + 2$. Find the length of $\overline{AC}$.



232 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 $\overline{EB}$.

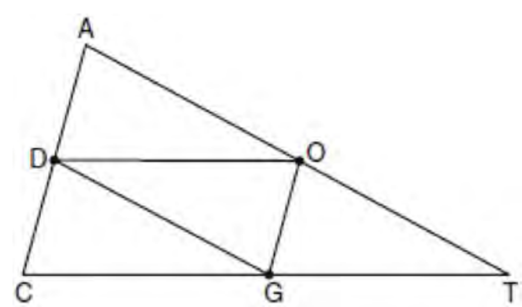


233 In the diagram below of $\triangle ACD$, E is a point on $\overline{AD}$ and B is a point on $\overline{AC}$, such that $\overline{EB} \parallel \overline{DC}$. If $AE = 3$, $ED = 6$, and $DC = 15$, find the length of $\overline{EB}$.



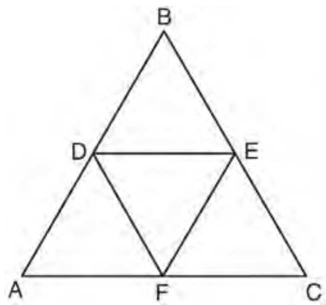
G.G.42: MIDSEGMENTS

234 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 $\overline{CT}$.



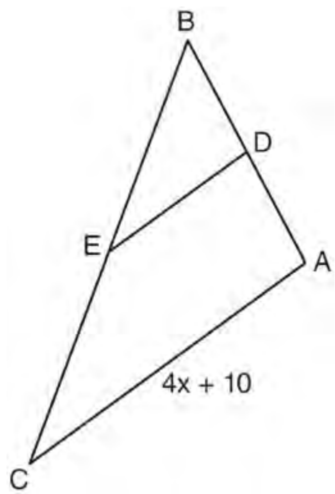
If $AC = 10$, $AT = 18$, and $CT = 22$, what is the perimeter of parallelogram $CDOG$?
1 21
2 25
3 32
4 40

235 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.



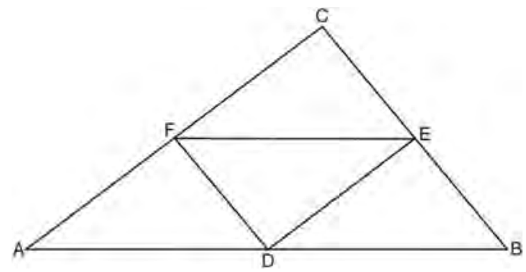
What is the length, in centimeters, of $\overline{EF}$?
1 6
2 12
3 18
4 4

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



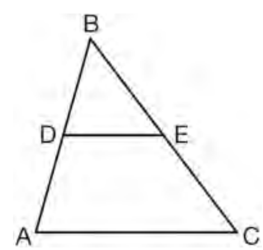
If $AC = 4x + 10$, which expression represents DE?
1 $x + 2.5$
2 $2x + 5$
3 $2x + 10$
4 $8x + 20$

237 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 $\overline{AC}$.



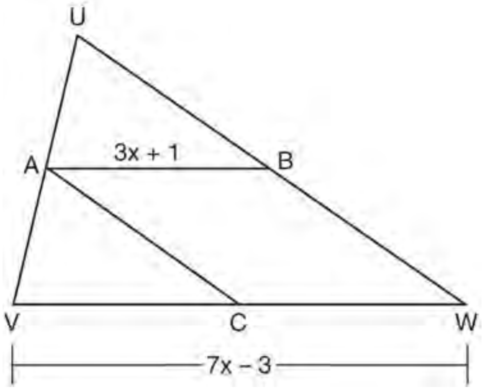
If $AB = 20$, $BC = 12$, and $AC = 16$, what is the perimeter of trapezoid $ABEF$?
1 24
2 36
3 40
4 44

238 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?



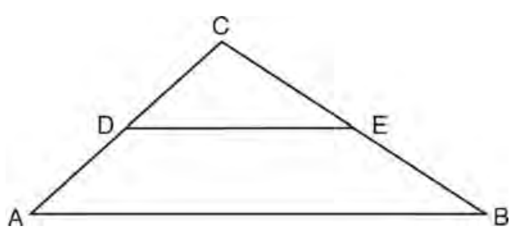
1 6
2 7
3 9
4 12

239 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

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



Which statement is *not* true?

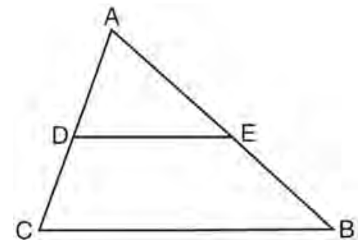
1 $CE = \frac{1}{2}CB$

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 $\triangle CAB$

241 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?

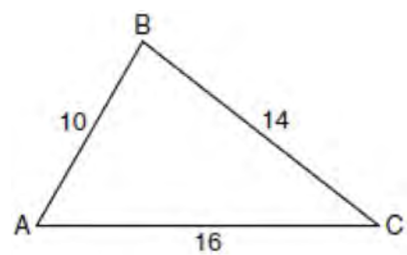
1 $DE = \frac{1}{2}CB$

2 $\overline{DE} \parallel \overline{CB}$

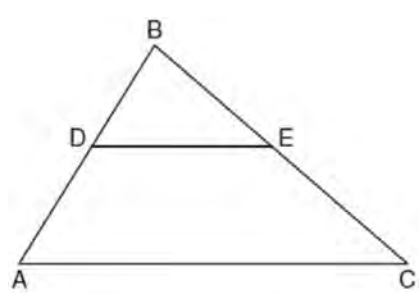
3 $\frac{AD}{DC} = \frac{DE}{CB}$

4 $\triangle ABC \sim \triangle AED$

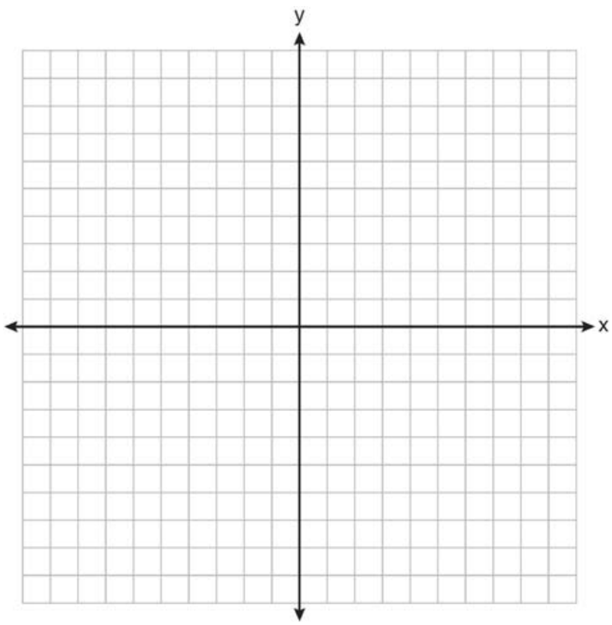
242 In the diagram of $\triangle ABC$ below, $AB = 10$, $BC = 14$, and $AC = 16$. Find the perimeter of the triangle formed by connecting the midpoints of the sides of $\triangle ABC$.



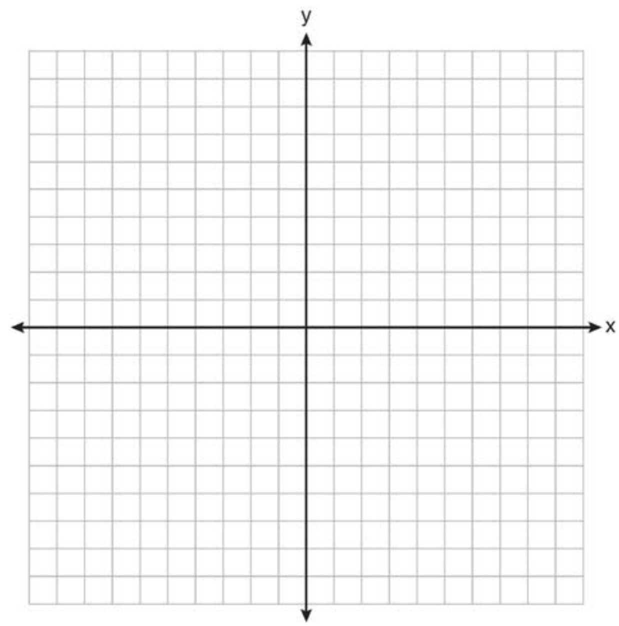
243 In the diagram below of $\triangle ABC$, $\overline{DE}$ is a midsegment of $\triangle ABC$, $DE = 7$, $AB = 10$, and $BC = 13$. Find the perimeter of $\triangle ABC$.



244 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 $\overline{GH} \parallel \overline{DE}$.

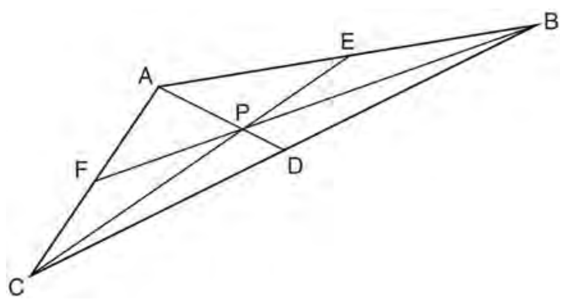


245 Triangle HKL has vertices $H(-7,2)$, $K(3,-4)$, and $L(5,4)$. The midpoint of $\overline{HL}$ is M and the midpoint of $\overline{LK}$ is N. Determine and state the coordinates of points M and N. Justify the statement: $\overline{MN}$ is parallel to $\overline{HK}$. [The use of the set of axes below is optional.]



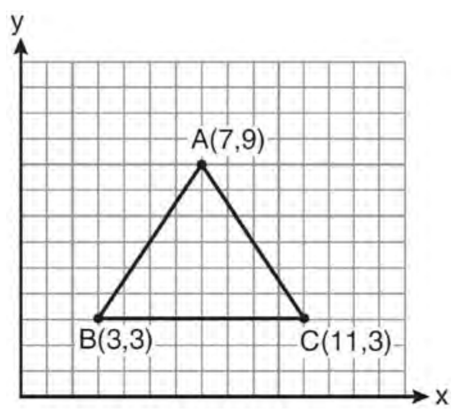
G.G.21: CENTROID, ORTHOCENTER, INCENTER AND CIRCUMCENTER

246 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

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



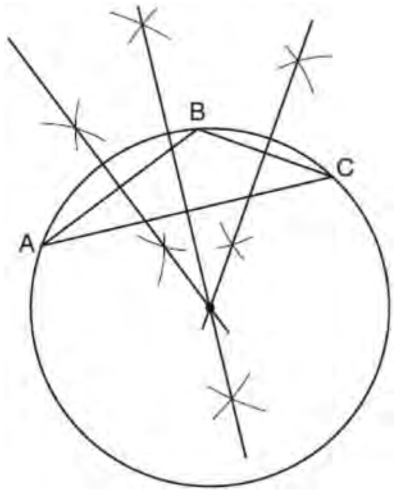
What are the coordinates of the centroid of $\triangle ABC$?
1 $(5,6)$
2 $(7,3)$
3 $(7,5)$
4 $(9,6)$

248 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

249 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

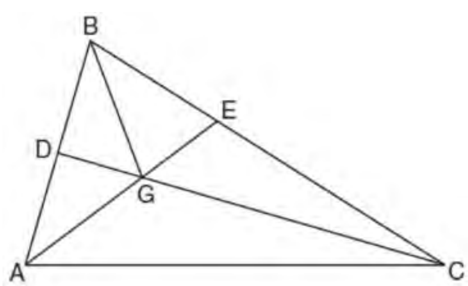
250 For a triangle, which two points of concurrence could be located outside the triangle?
1 incenter and centroid
2 centroid and orthocenter
3 incenter and circumcenter
4 circumcenter and orthocenter

251 The diagram below shows the construction of the center of the circle circumscribed about $\triangle ABC$.



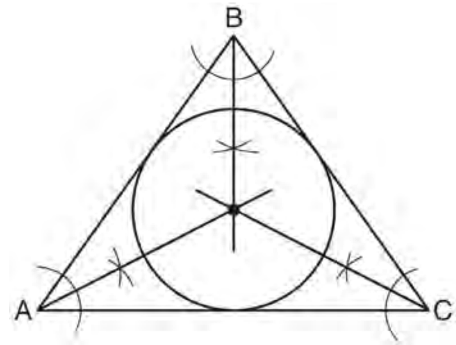
This construction represents how to find the intersection of
1 the angle bisectors of $\triangle ABC$
2 the medians to the sides of $\triangle ABC$
3 the altitudes to the sides of $\triangle ABC$
4 the perpendicular bisectors of the sides of $\triangle ABC$

252 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.



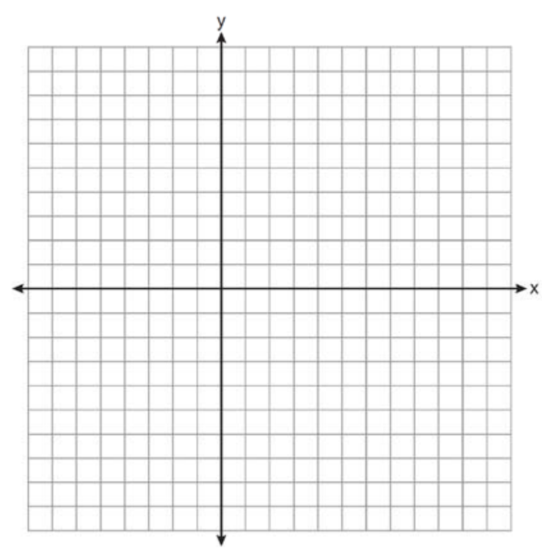
Which statement must be true?
1 $DG = EG$
2 $AG = BG$
3 $\angle AEB \cong \angle AEC$
4 $\angle DBG \cong \angle EBG$

253 Which geometric principle is used in the construction shown below?



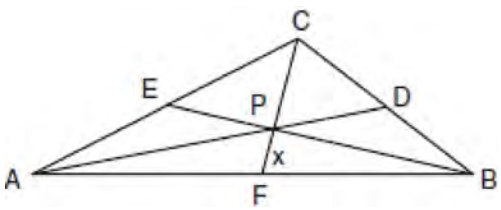
1 The intersection of the angle bisectors of a triangle is the center of the inscribed circle.
2 The intersection of the angle bisectors of a triangle is the center of the circumscribed circle.
3 The intersection of the perpendicular bisectors of the sides of a triangle is the center of the inscribed circle.
4 The intersection of the perpendicular bisectors of the sides of a triangle is the center of the circumscribed circle.

254 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.]



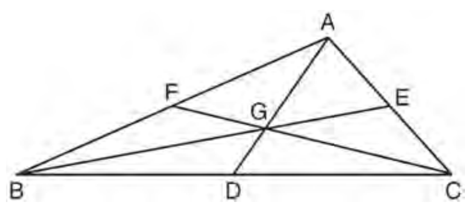
G.G.43: CENTROID

255 In the diagram of ΔABC below, Jose found centroid P by constructing the three medians. He measured $\overline{CF}$ and found it to be 6 inches.



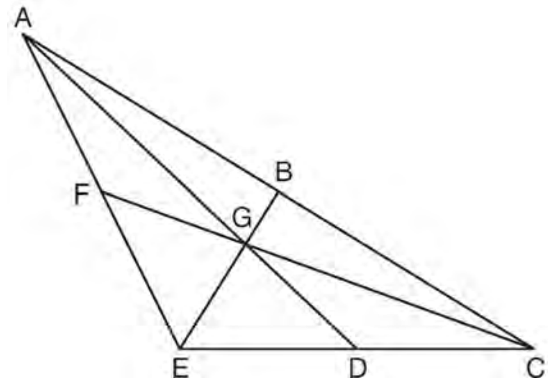
If $PF = x$, which equation can be used to find x?
1 $x + x = 6$
2 $2x + x = 6$
3 $3x + 2x = 6$
4 $x + \frac{2}{3}x = 6$

256 In the diagram below of ΔABC, medians $\overline{AD}$, $\overline{BE}$, and $\overline{CF}$ intersect at G.



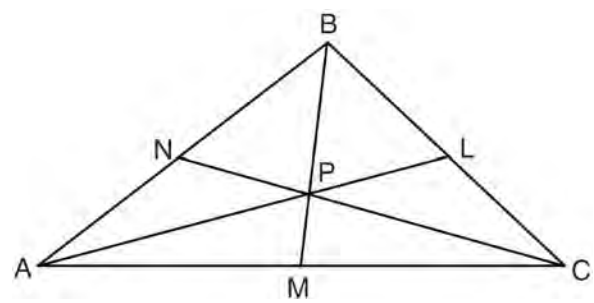
If $CF = 24$, what is the length of $\overline{FG}$?
1 8
2 10
3 12
4 16

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



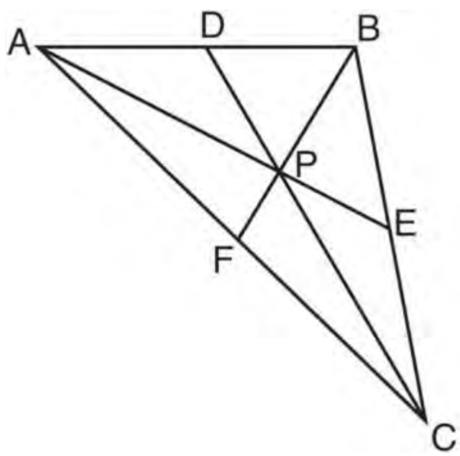
What is the length, in centimeters, of $\overline{GC}$?
1 24
2 12
3 6
4 4

258 In the diagram below, point P is the centroid of ΔABC.



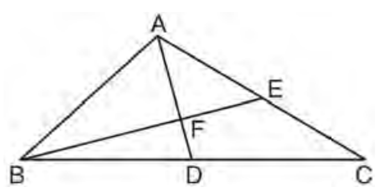
If $PM = 2x + 5$ and $BP = 7x + 4$, what is the length of $\overline{PM}$?
1 9
2 2
3 18
4 27

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



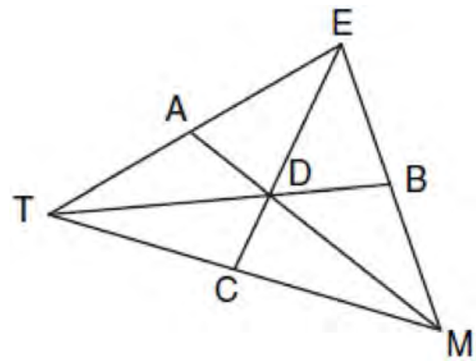
What is the length of $\overline{BP}$?
1 6
2 9
3 3
4 12

260 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

261 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 $\overline{TD}$.



G.G.69: TRIANGLES IN THE COORDINATE PLANE

262 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 $m\angle ABC = 60$

263 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

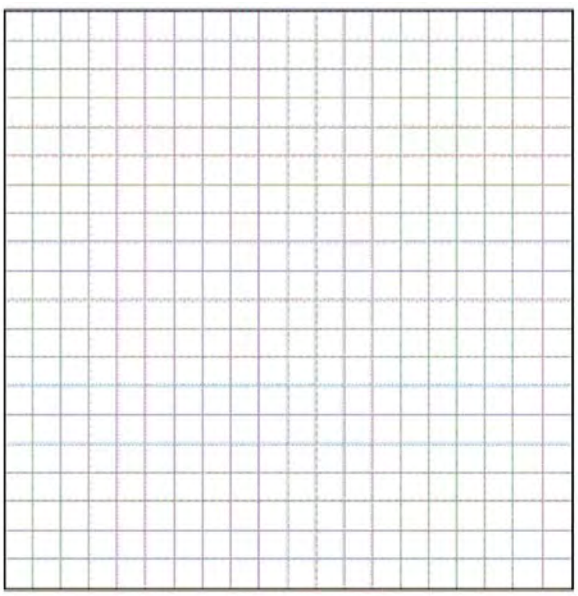
264 Which type of triangle can be drawn using the points $(-2,3)$, $(-2,-7)$, and $(4,-5)$?
1 scalene
2 isosceles
3 equilateral
4 no triangle can be drawn

265 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

266 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.

267 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.]



POLYGONS

G.G.36: INTERIOR AND EXTERIOR ANGLES OF POLYGONS

268 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 $\frac{(n-2) \cdot 180}{n}$

269 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

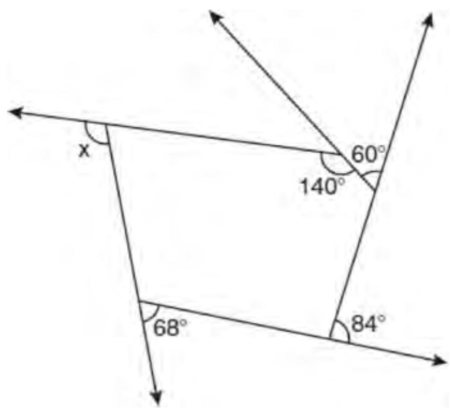
270 In which polygon does the sum of the measures of the interior angles equal the sum of the measures of the exterior angles?

1 triangle
2 hexagon
3 octagon
4 quadrilateral

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

1 72
2 360
3 540
4 720

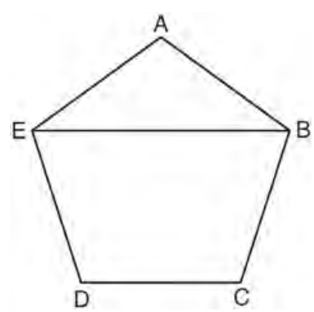
272 The pentagon in the diagram below is formed by five rays.



What is the degree measure of angle x?
1 72
2 96
3 108
4 112

G.G.37: INTERIOR AND EXTERIOR ANGLES OF POLYGONS

273 In the diagram below of regular pentagon $ABCDE$, $\overline{EB}$ is drawn.



What is the measure of $\angle AEB$?
1 36º
2 54º
3 72º
4 108º

274 What is the measure of an interior angle of a regular octagon?
1 45º
2 60º
3 120º
4 135º

275 What is the measure of each interior angle of a regular hexagon?
1 60°
2 120°
3 135°
4 270°

276 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

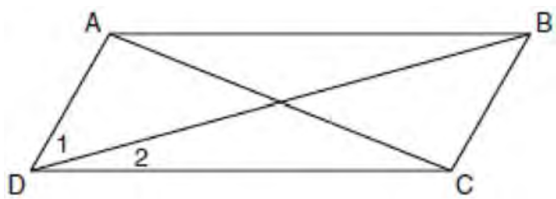
277 What is the difference between the sum of the measures of the interior angles of a regular pentagon and the sum of the measures of the exterior angles of a regular pentagon?
1 36
2 72
3 108
4 180

278 Find, in degrees, the measures of both an interior angle and an exterior angle of a regular pentagon.

279 Determine, in degrees, the measure of each interior angle of a regular octagon.

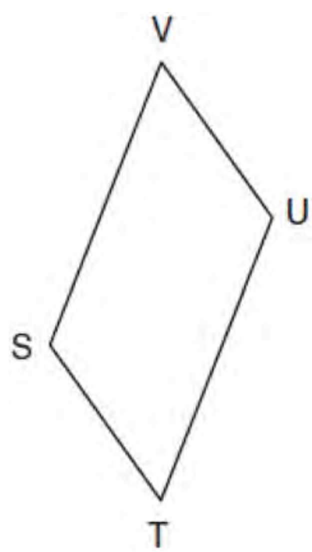
G.G.38: PARALLELOGRAMS

280 In the diagram below of parallelogram *ABCD* with diagonals $\overline{AC}$ and $\overline{BD}$, m∠1 = 45 and m∠*DCB* = 120.



What is the measure of ∠2?
1 15º
2 30º
3 45º
4 60º

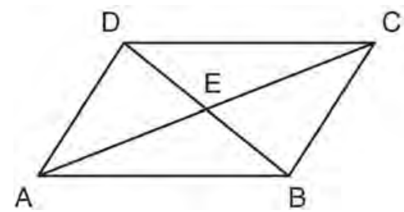
281 In the diagram below of parallelogram *STUV*, $SV = x + 3$, $VU = 2x - 1$, and $TU = 4x - 3$.



What is the length of $\overline{SV}$?
1 5
2 2
3 7
4 4

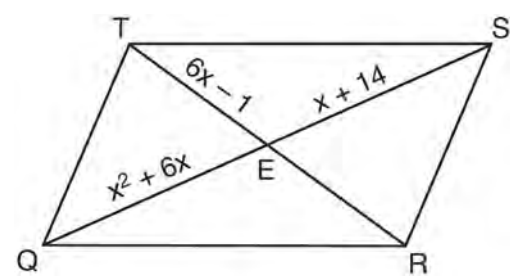
282 Which statement is true about every parallelogram?
1 All four sides are congruent.
2 The interior angles are all congruent.
3 Two pairs of opposite sides are congruent.
4 The diagonals are perpendicular to each other.

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



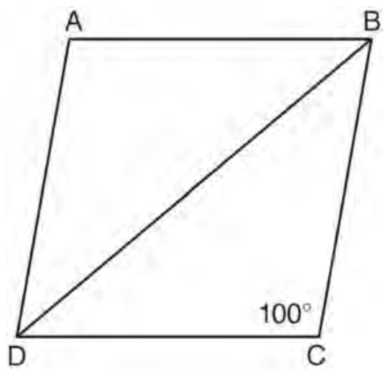
Which expression is *not* always true?
1 ∠*DAE* ≅ ∠*BCE*
2 ∠*DEC* ≅ ∠*BEA*
3 $\overline{AC} \cong \overline{DB}$
4 $\overline{DE} \cong \overline{EB}$

284 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.



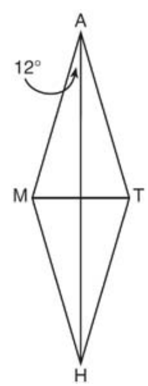
G.G.39: PARALLELOGRAMS

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



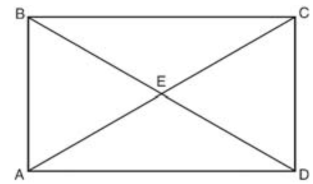
What is $m\angle DBC$?
1 40
2 45
3 50
4 80

286 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

287 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

288 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

289 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 $10\sqrt{2}$

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

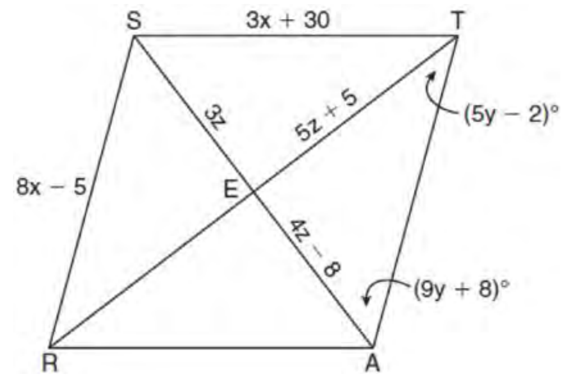
291 Which reason could be used to prove that a parallelogram is a rhombus?
1 Diagonals are congruent.
2 Opposite sides are parallel.
3 Diagonals are perpendicular.
4 Opposite angles are congruent.

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

293 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

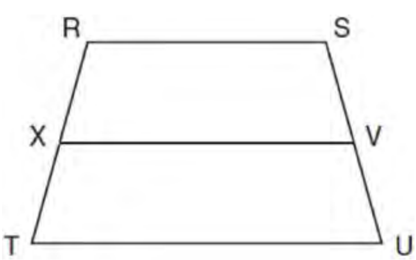
294 Given three distinct quadrilaterals, a square, a rectangle, and a rhombus, which quadrilaterals must have perpendicular diagonals?
1 the rhombus, only
2 the rectangle and the square
3 the rhombus and the square
4 the rectangle, the rhombus, and the square

295 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 $m\angle TAS$.



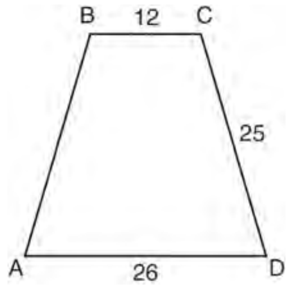
G.G.40: TRAPEZOIDS

296 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 $\overline{SU}$.



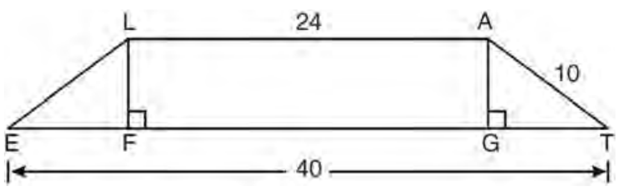
If $RS = 30$ and $XV = 44$, what is the length of $\overline{TU}$?
1 37
2 58
3 74
4 118

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



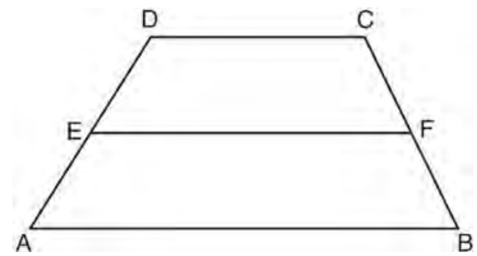
What is the length of an altitude of the trapezoid?
1 7
2 14
3 19
4 24

298 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.



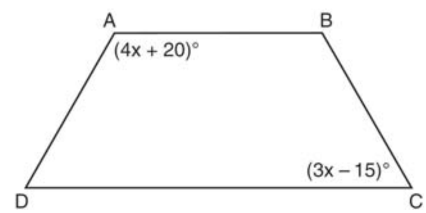
What is the length of $\overline{LF}$?
1 6
2 8
3 3
4 4

299 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

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



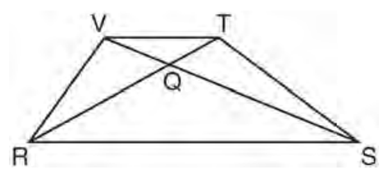
What is $m\angle D$?
1 25
2 35
3 60
4 90

301 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 $\frac{1}{2}$

302 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

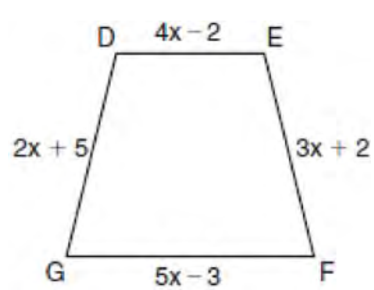
303 If the diagonals of a quadrilateral do *not* bisect each other, then the quadrilateral could be a
1 rectangle
2 rhombus
3 square
4 trapezoid

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

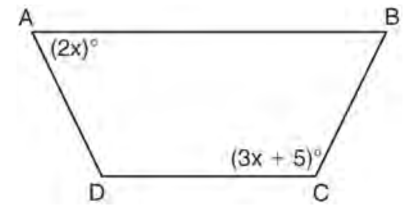


If trapezoid $RSTV$ is *not* isosceles, which triangle is equal in area to ΔRSV?
1 ΔRQV
2 ΔRST
3 ΔRVT
4 ΔSVT

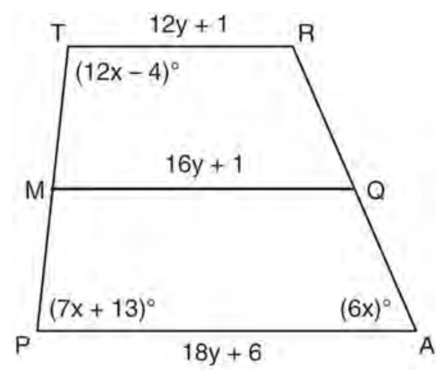
305 In the diagram below of isosceles trapezoid $DEFG$, $\overline{DE} \parallel \overline{GF}$, $DE = 4x - 2$, $EF = 3x + 2$, $FG = 5x - 3$, and $GD = 2x + 5$. Find the value of x.



306 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 $m\angle BAD$.



307 Trapezoid $TRAP$, with median $\overline{MQ}$, is shown in the diagram below. Solve algebraically for x and y.



G.G.41: SPECIAL QUADRILATERALS

308 A quadrilateral whose diagonals bisect each other and are perpendicular is a
1 rhombus
2 rectangle
3 trapezoid
4 parallelogram

G.G.69: QUADRILATERALS IN THE COORDINATE PLANE

309 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?

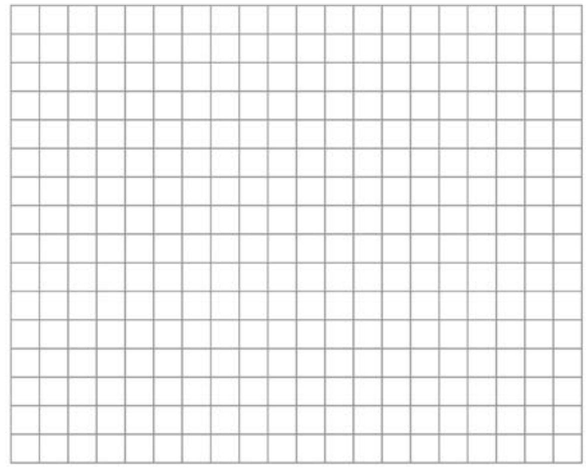
1 $\overline{AB}$ and $\overline{DC}$
2 $\overline{AB}$ and $\overline{BC}$
3 $\overline{AD}$ and $\overline{BC}$
4 $\overline{AC}$ and $\overline{BD}$

310 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 $\overline{BD}$?

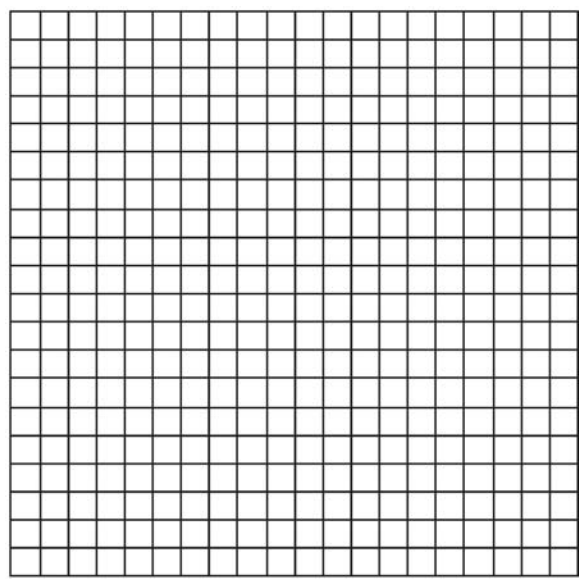
1 $(2,2)$
2 $(4.5,1)$
3 $(3.5,2)$
4 $(-1,3)$

311 The coordinates of two vertices of square *ABCD* are $A(2,1)$ and $B(4,4)$. Determine the slope of side $\overline{BC}$.

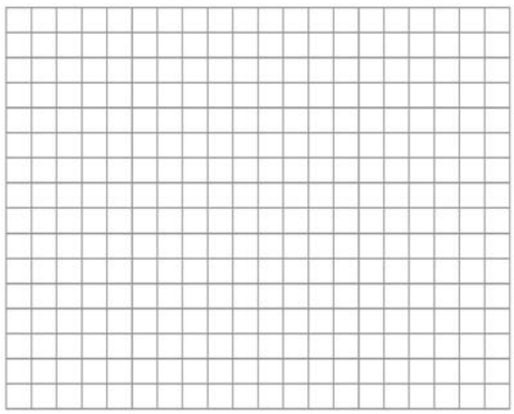
312 Given: Quadrilateral *ABCD* has vertices $A(-5,6)$, $B(6,6)$, $C(8,-3)$, and $D(-3,-3)$.
Prove: Quadrilateral *ABCD* is a parallelogram but is neither a rhombus nor a rectangle. [The use of the grid below is optional.]



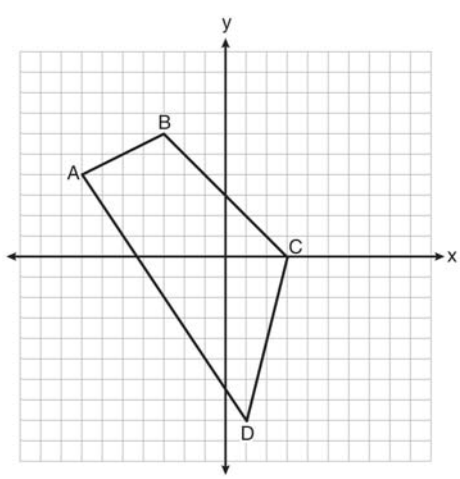
313 Quadrilateral *MATH* has coordinates $M(1,1)$, $A(-2,5)$, $T(3,5)$, and $H(6,1)$. Prove that quadrilateral *MATH* is a rhombus and prove that it is *not* a square. [The use of the grid is optional.]



314 Given: ΔABC 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.]



315 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.

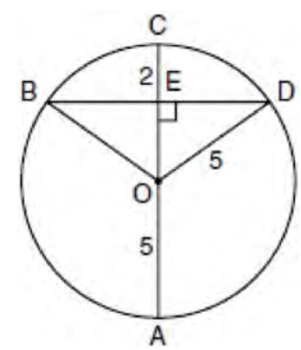


CONICS

G.G.49: CHORDS

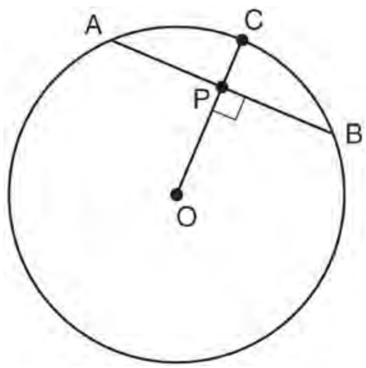
316 In circle O, diameter $\overline{AB}$ intersects chord $\overline{CD}$ at E. If $CE = ED$, then $\angle CEA$ is which type of angle?
1 straight
2 obtuse
3 acute
4 right

317 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.



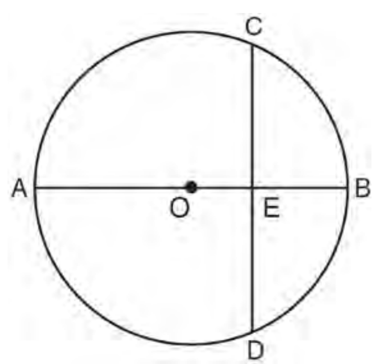
What is the length of $\overline{BD}$?
1 12
2 10
3 8
4 4

318 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.



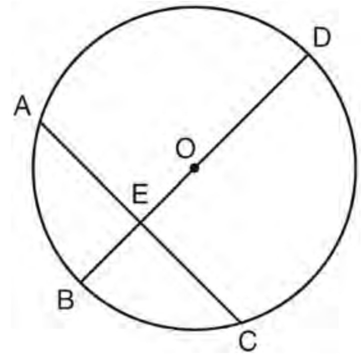
What is the length of $\overline{OP}$, in centimeters?
1 8
2 2
3 3
4 4

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



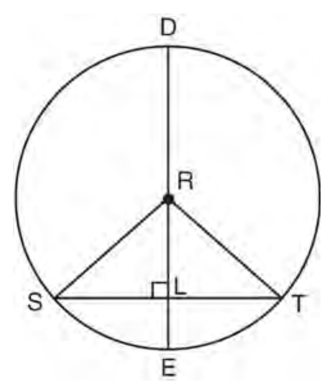
What is the length of $\overline{CE}$?
1 $4\sqrt{3}$
2 $2\sqrt{3}$
3 $8\sqrt{2}$
4 $4\sqrt{2}$

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



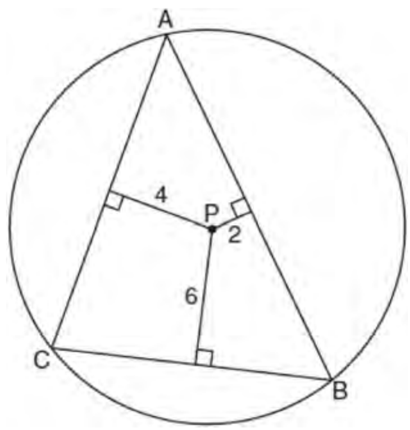
If $DB = 34$, $AC = 30$, and $DE > BE$, what is the length of $\overline{BE}$?
1 8
2 9
3 16
4 25

321 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 $(DL)(LE) = (SL)(LT)$

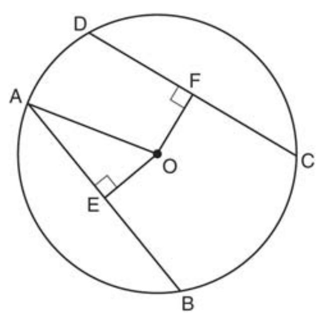
322 In the diagram below, ΔABC is inscribed in circle P. The distances from the center of circle P to each side of the triangle are shown.



Which statement about the sides of the triangle is true?

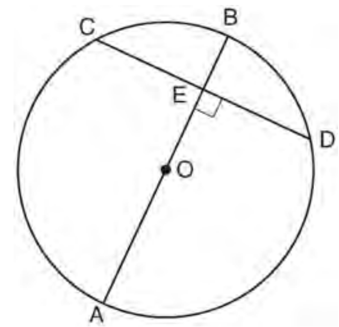
1 $AB > AC > BC$
2 $AB < AC$ and $AC > BC$
3 $AC > AB > BC$
4 $AC = AB$ and $AB > BC$

323 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 $CD = 4y - 20$.



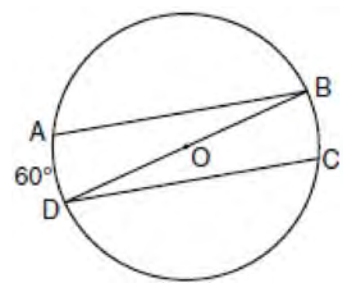
Determine the length of $\overline{DF}$. Determine the length of $\overline{OA}$.

324 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 $\overline{CE}$.



G.G.52: CHORDS

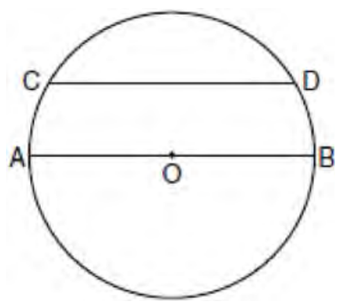
325 In the diagram of circle O below, chords $\overline{AB}$ and $\overline{CD}$ are parallel, and $\overline{BD}$ is a diameter of the circle.



If $m\overset{\frown}{AD} = 60$, what is $m\angle CDB$?

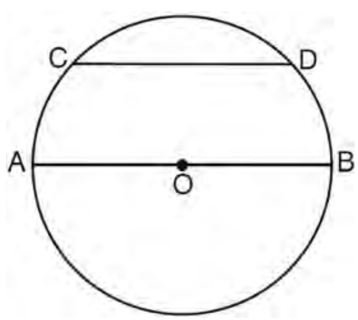
1 20
2 30
3 60
4 120

326 In the diagram of circle O below, chord $\overline{CD}$ is parallel to diameter $\overline{AOB}$ and $m\overset{\frown}{AC} = 30$.



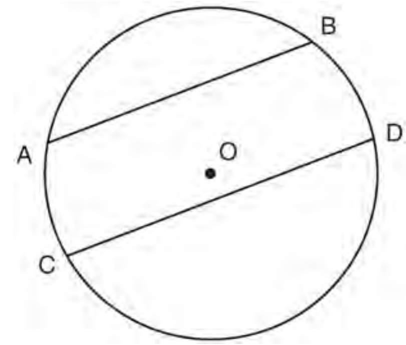
What is $m\overset{\frown}{CD}$?
1 150
2 120
3 100
4 60

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



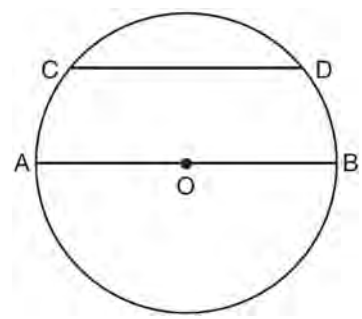
If $m\overset{\frown}{CD} = 70$, what is $m\overset{\frown}{AC}$?
1 110
2 70
3 55
4 35

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



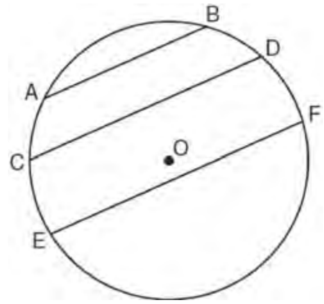
If $m\overset{\frown}{AB} = 104$ and $m\overset{\frown}{CD} = 168$, what is $m\overset{\frown}{BD}$?
1 38
2 44
3 88
4 96

329 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

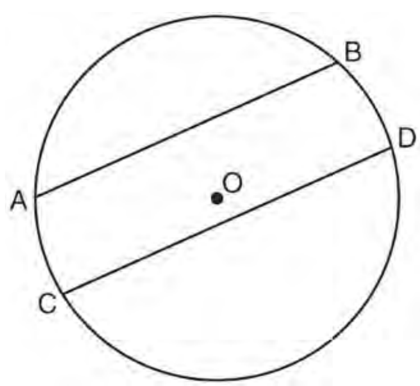
330 In the diagram below of circle O, chord $\overline{AB} \parallel$ chord $\overline{CD}$, and chord $\overline{CD} \parallel$ chord $\overline{EF}$.



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 $\overset{\frown}{EF} \cong \overset{\frown}{CD}$

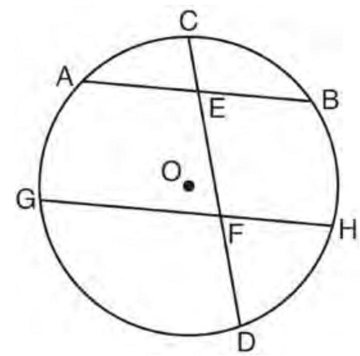
331 In the diagram below of circle O, chord $\overline{AB}$ is parallel to chord $\overline{CD}$.



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 $\overset{\frown}{ABD} \cong \overset{\frown}{CDB}$

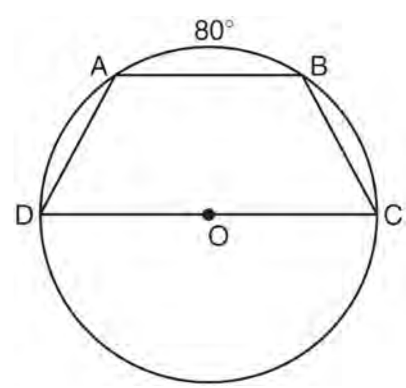
332 In the diagram below of circle O, chord $\overline{AB}$ is parallel to chord $\overline{GH}$. Chord $\overline{CD}$ intersects $\overline{AB}$ at E and $\overline{GH}$ at F.



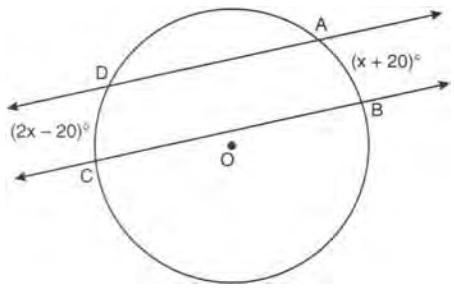
Which statement must always be true?

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 $\overset{\frown}{AG} \cong \overset{\frown}{BH}$

333 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 $m\overset{\frown}{BC}$.

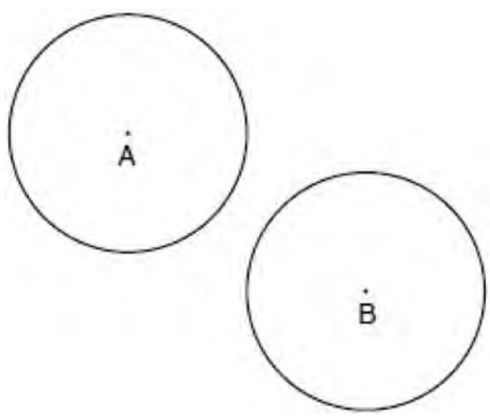


334 In the diagram below, two parallel lines intersect circle O at points A, B, C, and D, with $m\overset{\frown}{AB} = x + 20$ and $m\overset{\frown}{DC} = 2x - 20$. Find $m\overset{\frown}{AB}$.



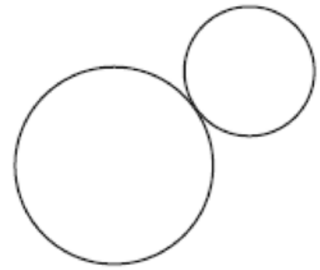
G.G.50: TANGENTS

335 In the diagram below, circle A and circle B are shown.



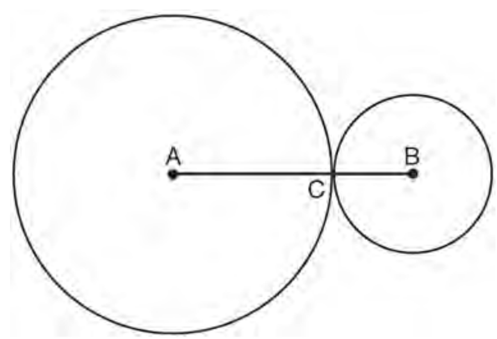
What is the total number of lines of tangency that are common to circle A and circle B?
1 1
2 2
3 3
4 4

336 How many common tangent lines can be drawn to the two externally tangent circles shown below?



1 1
2 2
3 3
4 4

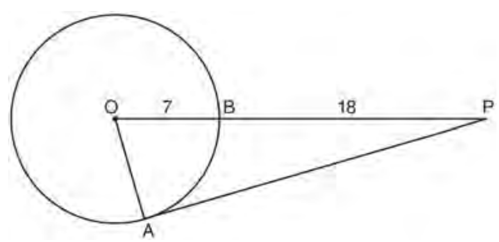
337 In the diagram below, circles A and B are tangent at point C and $\overline{AB}$ is drawn. Sketch all common tangent lines.



338 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°

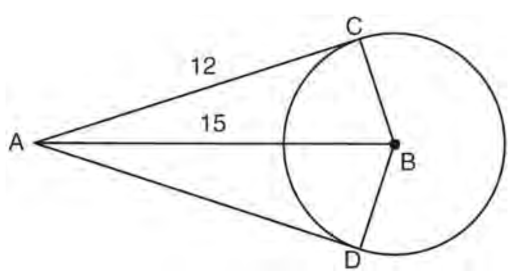
339 Line segment AB is tangent to circle O at A. Which type of triangle is always formed when points A, B, and O are connected?
1 right
2 obtuse
3 scalene
4 isosceles

340 In the diagram below of ΔPAO, $\overline{AP}$ 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

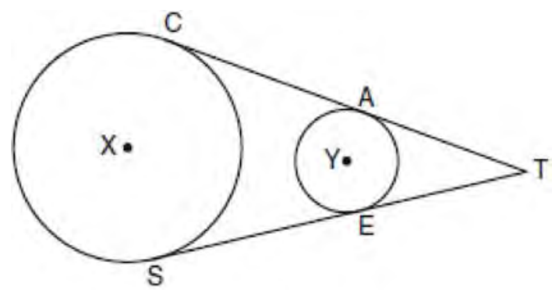
341 In the diagram below, $\overline{AC}$ and $\overline{AD}$ are tangent to circle B at points C and D, respectively, and $\overline{BC}$, $\overline{BD}$, and $\overline{BA}$ are drawn.



If $AC = 12$ and $AB = 15$, what is the length of $\overline{BD}$?
1 5.5
2 9
3 12
4 18

342 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 140º
2 100º
3 70º
4 50º

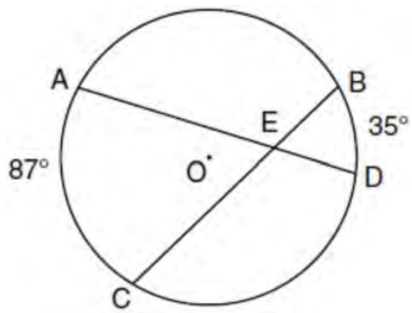
343 In the diagram below, circles X and Y have two tangents drawn to them from external point T. The points of tangency are C, A, S, and E. The ratio of TA to AC is $1:3$. If $TS = 24$, find the length of $\overline{SE}$.



(Not drawn to scale)

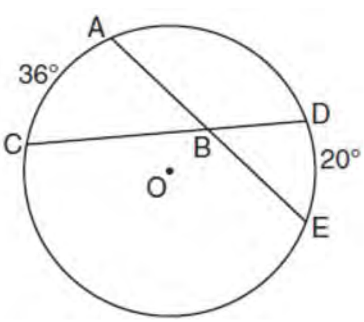
G.G.51: ARCS DETERMINED BY ANGLES

344 In the diagram below of circle O, chords $\overline{AD}$ and $\overline{BC}$ intersect at E, $m\overset{\frown}{AC} = 87$, and $m\overset{\frown}{BD} = 35$.



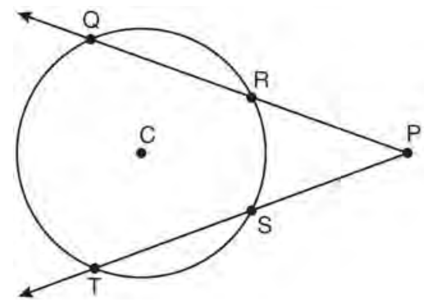
What is the degree measure of $\angle CEA$?
1 87
2 61
3 43.5
4 26

345 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 $m\overset{\frown}{DE} = 20$.



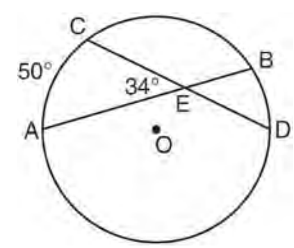
What is $m\angle ABC$?
1 56
2 36
3 28
4 8

346 In the diagram below of circle C, $m\overset{\frown}{QT} = 140$, and $m\angle P = 40$.



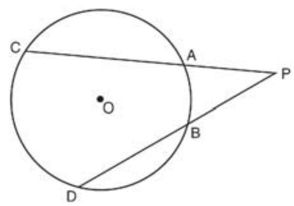
What is $m\overset{\frown}{RS}$?
1 50
2 60
3 90
4 110

347 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

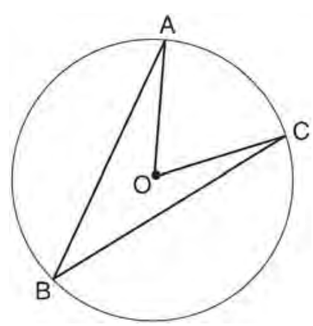
348 In the diagram below of circle O, $\overline{PAC}$ and $\overline{PBD}$ are secants.



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

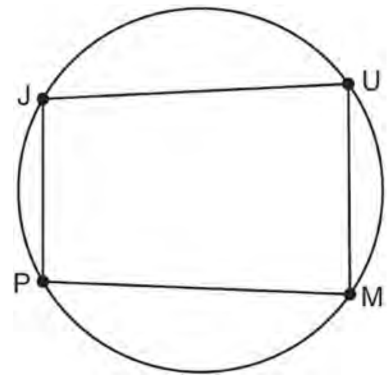
349 Circle O with $\angle AOC$ and $\angle ABC$ is shown in the diagram below.



What is the ratio of m$\angle AOC$ to m$\angle ABC$?

1 1 : 1
2 2 : 1
3 3 : 1
4 1 : 2

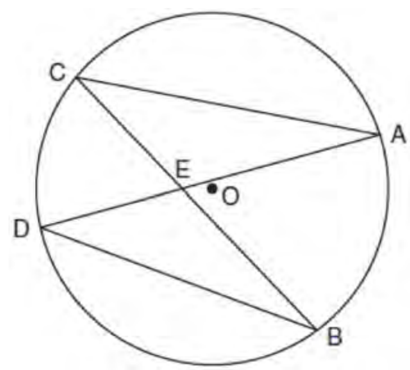
350 In the diagram below, quadrilateral $JUMP$ is inscribed in a circle..



Opposite angles J and M must be

1 right
2 complementary
3 congruent
4 supplementary

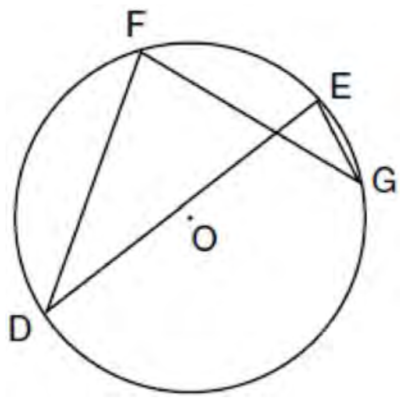
351 In the diagram below of circle O, chords $\overline{AD}$ and $\overline{BC}$ intersect at E.



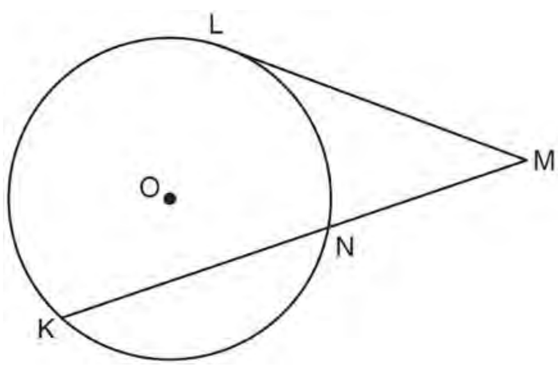
Which relationship must be true?

1 $\triangle CAE \cong \triangle DBE$
2 $\triangle AEC \sim \triangle BED$
3 $\angle ACB \cong \angle CBD$
4 $\overset{\frown}{CA} \cong \overset{\frown}{DB}$

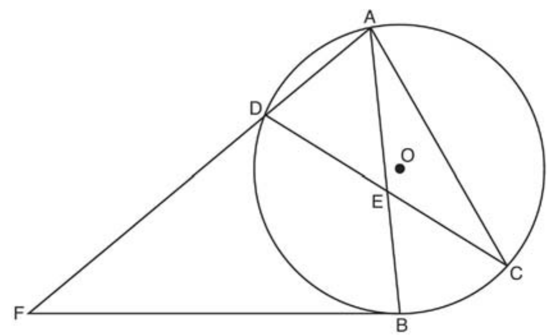
352 In the diagram below of circle O, chords $\overline{DF}$, $\overline{DE}$, $\overline{FG}$, and $\overline{EG}$ are drawn such that $m\overset{\frown}{DF}:m\overset{\frown}{FE}:m\overset{\frown}{EG}:m\overset{\frown}{GD} = 5:2:1:7$. Identify one pair of inscribed angles that are congruent to each other and give their measure.



353 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 $m\angle LMK$.



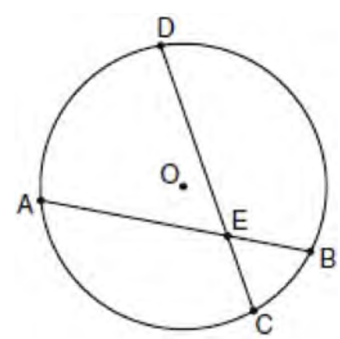
354 Chords $\overline{AB}$ and $\overline{CD}$ intersect at E in circle O, as shown in the diagram below. Secant $\overline{FDA}$ and tangent $\overline{FB}$ are drawn to circle O from external point F and chord $\overline{AC}$ is drawn. The $m\overset{\frown}{DA} = 56$, $m\overset{\frown}{DB} = 112$, and the ratio of $m\overset{\frown}{AC}:m\overset{\frown}{CB} = 3:1$.



Determine $m\angle CEB$. Determine $m\angle F$. Determine $m\angle DAC$.

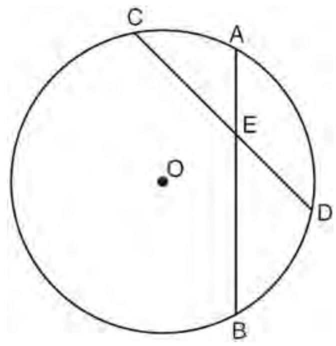
G.G.53: SEGMENTS INTERCEPTED BY CIRCLE

355 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

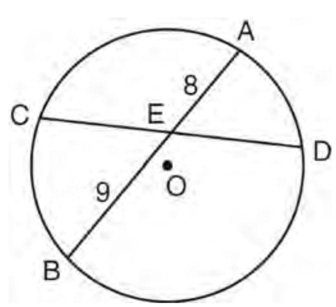
356 In the diagram below of circle O, chords $\overline{AB}$ and $\overline{CD}$ intersect at E.



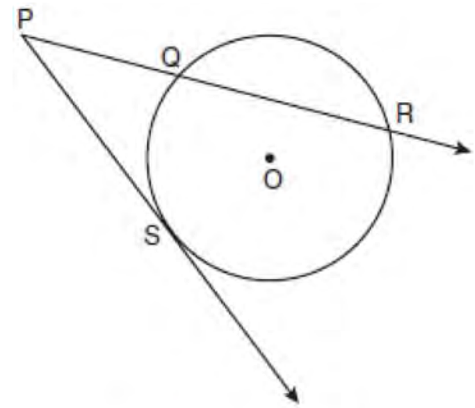
If $CE = 10$, $ED = 6$, and $AE = 4$, what is the length of $\overline{EB}$?
1 15
2 12
3 6.7
4 2.4

357 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

358 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.



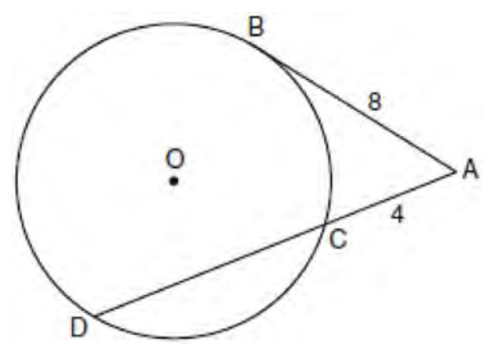
359 In the diagram below, $\overline{PS}$ is a tangent to circle O at point S, $\overline{PQR}$ is a secant, $PS = x$, $PQ = 3$, and $PR = x + 18$.



(Not drawn to scale)

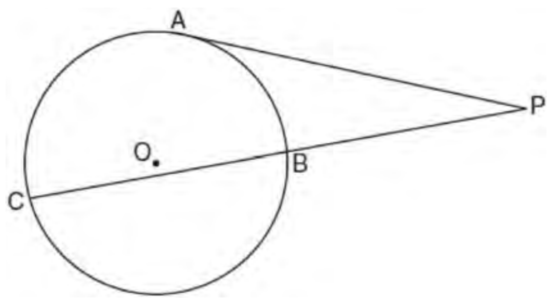
What is the length of $\overline{PS}$?
1 6
2 9
3 3
4 27

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



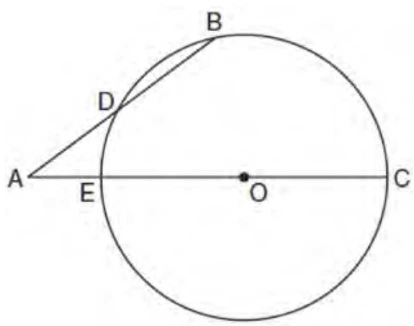
What is the length of $\overline{CD}$?
1 16
2 13
3 12
4 10

361 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

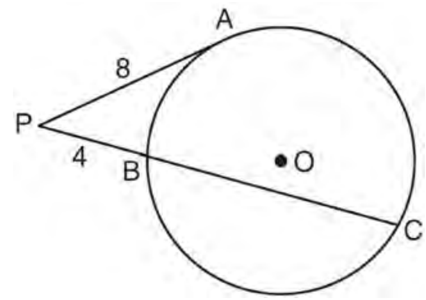
362 In the diagram below of circle O, secant $\overline{AB}$ intersects circle O at D, secant $\overline{AOC}$ intersects circle O at E, $AE = 4$, $AB = 12$, and $DB = 6$.



(Not drawn to scale)

What is the length of $\overline{OC}$?
1 4.5
2 7
3 9
4 14

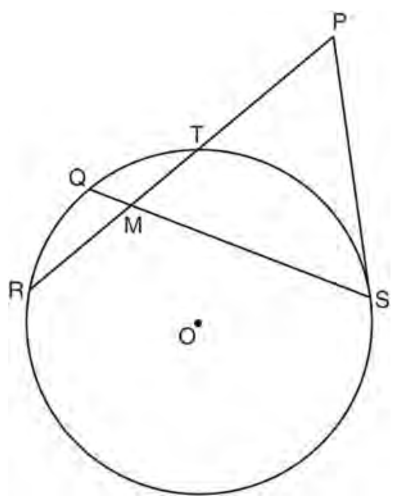
363 In the diagram below of circle O, $\overline{PA}$ is tangent to circle O at A, and $\overline{PBC}$ is a secant with points B and C on the circle.



If $PA = 8$ and $PB = 4$, what is the length of $\overline{BC}$?
1 20
2 16
3 15
4 12

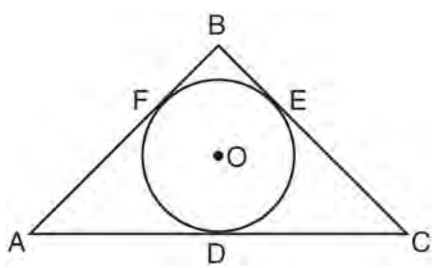
364 Secants $\overline{JKL}$ and $\overline{JMN}$ are drawn to circle O from an external point, J. If $JK = 8$, $LK = 4$, and $JM = 6$, what is the length of $\overline{JN}$?
1 16
2 12
3 10
4 8

365 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 $PT = 8$.



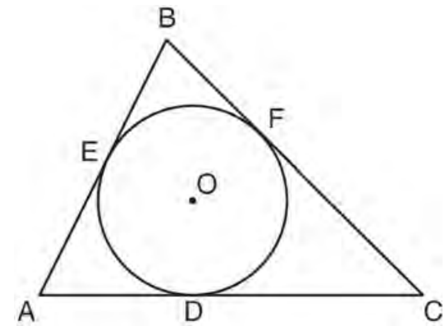
Find the length of $\overline{RT}$. Find the length of $\overline{PS}$.

366 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 ΔABC?
1 15
2 25
3 30
4 60

367 In the diagram below, ΔABC is circumscribed about circle O and the sides of ΔABC 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

G.G.71: EQUATIONS OF CIRCLES

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

369 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 $(x-2)^2 + (y+3)^2 = 25$

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

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

372 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 $(x-2)^2+(y+8)^2=81$

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

374 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 $(x+5)^2+(y-4)^2=49$

375 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 $(x-4)^2+y^2=36$

376 Write an equation of a circle whose center is $(-3,2)$ and whose diameter is 10.

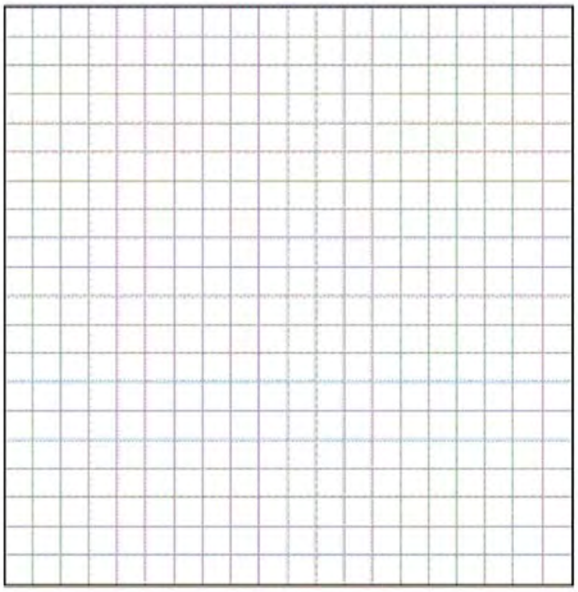
377 Which equation represents the circle whose center is $(-5,3)$ and that passes through the point $(-1,3)$?

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

378 The diameter of a circle has endpoints at $(-2,3)$ and $(6,3)$. What is an equation of the circle?

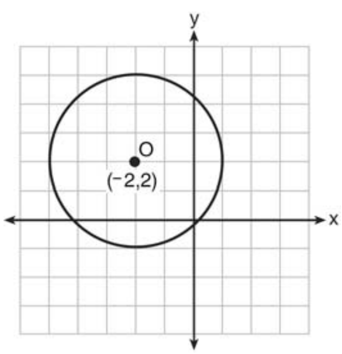
1 $(x-2)^2+(y-3)^2=16$
2 $(x-2)^2+(y-3)^2=4$
3 $(x+2)^2+(y+3)^2=16$
4 $(x+2)^2+(y+3)^2=4$

379 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.]



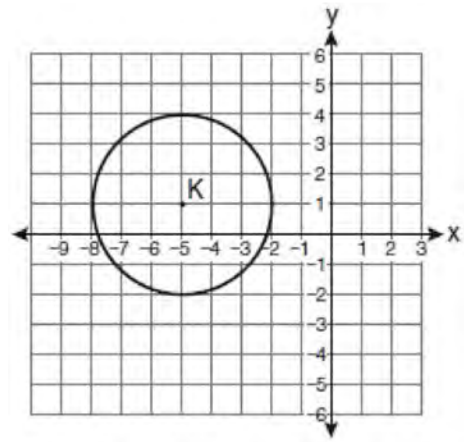
G.G.72: EQUATIONS OF CIRCLES

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



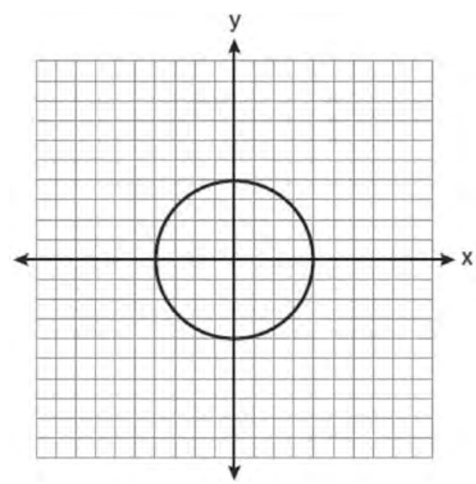
1 $(x+2)^2+(y-2)^2=9$
2 $(x+2)^2+(y-2)^2=3$
3 $(x-2)^2+(y+2)^2=9$
4 $(x-2)^2+(y+2)^2=3$

381 Which equation represents circle K shown in the graph below?



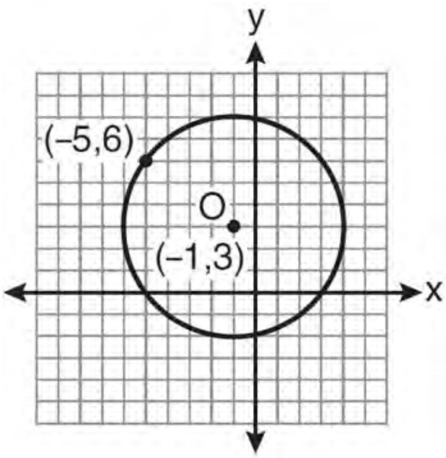
1 $(x+5)^2+(y-1)^2=3$
2 $(x+5)^2+(y-1)^2=9$
3 $(x-5)^2+(y+1)^2=3$
4 $(x-5)^2+(y+1)^2=9$

382 What is an equation for the circle shown in the graph below?



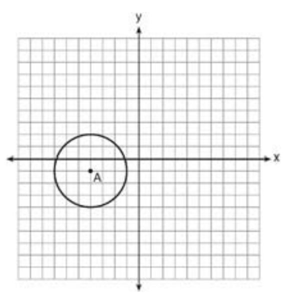
1 $x^2+y^2=2$
2 $x^2+y^2=4$
3 $x^2+y^2=8$
4 $x^2+y^2=16$

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



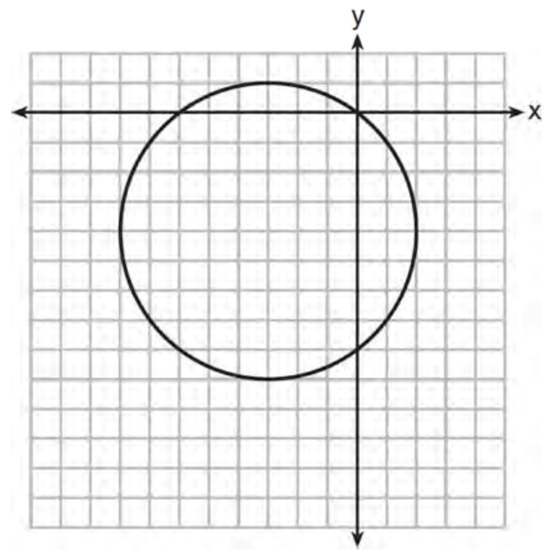
1 $(x+1)^2 + (y-3)^2 = 25$
2 $(x-1)^2 + (y+3)^2 = 25$
3 $(x-5)^2 + (y+6)^2 = 25$
4 $(x+5)^2 + (y-6)^2 = 25$

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



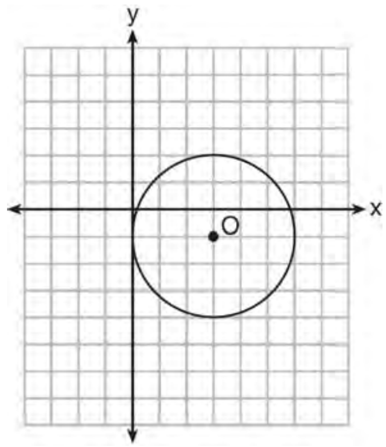
1 $(x-4)^2 + (y-1)^2 = 3$
2 $(x+4)^2 + (y+1)^2 = 3$
3 $(x-4)^2 + (y-1)^2 = 9$
4 $(x+4)^2 + (y+1)^2 = 9$

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



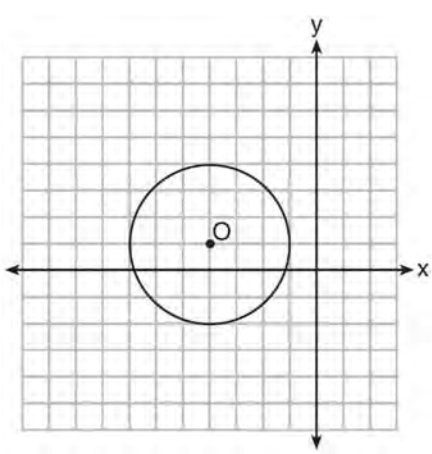
1 $(x-3)^2 + (y-4)^2 = 25$
2 $(x+3)^2 + (y+4)^2 = 25$
3 $(x-3)^2 + (y-4)^2 = 10$
4 $(x+3)^2 + (y+4)^2 = 10$

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



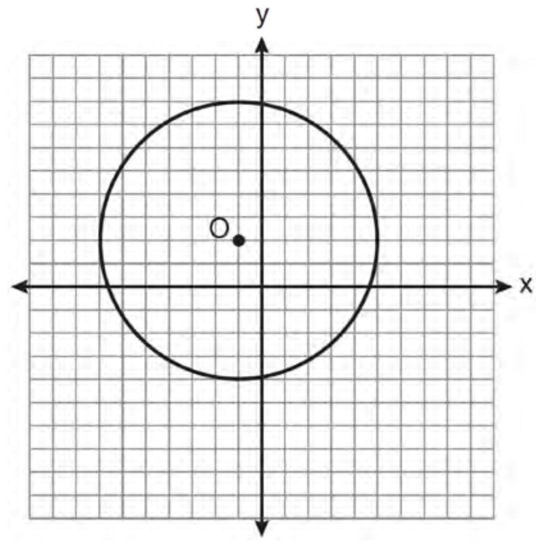
1 $(x-3)^2+(y+1)^2=6$
2 $(x+3)^2+(y-1)^2=6$
3 $(x-3)^2+(y+1)^2=9$
4 $(x+3)^2+(y-1)^2=9$

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

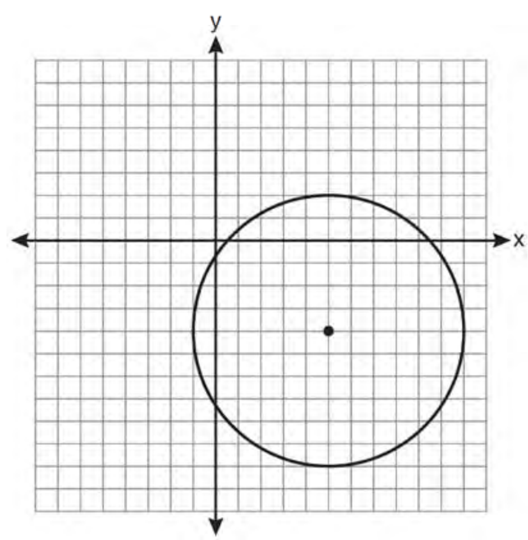


1 $(x+4)^2+(y-1)^2=3$
2 $(x-4)^2+(y+1)^2=3$
3 $(x+4)^2+(y-1)^2=9$
4 $(x-4)^2+(y+1)^2=9$

388 Write an equation for circle O shown on the graph below.



389 Write an equation of the circle graphed in the diagram below.



G.G.73: EQUATIONS OF CIRCLES

390 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 = $\sqrt{C}$

391 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 $\sqrt{13}$

392 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

393 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

394 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

395 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

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

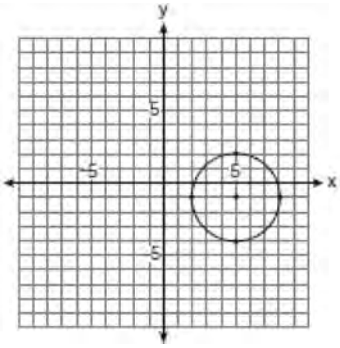
397 The equation of a circle is $(x-2)^2+(y+5)^2=32$. What are the coordinates of the center of this circle and the length of its radius?
1 $(-2,5)$ and 16
2 $(2,-5)$ and 16
3 $(-2,5)$ and $4\sqrt{2}$
4 $(2,-5)$ and $4\sqrt{2}$

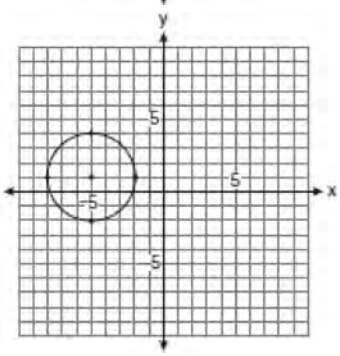
398 Which set of equations represents two circles that have the same center?
1 $x^2+(y+4)^2=16$ and $(x+4)^2+y^2=16$
2 $(x+3)^2+(y-3)^2=16$ and $(x-3)^2+(y+3)^2=25$
3 $(x-7)^2+(y-2)^2=16$ and $(x+7)^2+(y+2)^2=25$
4 $(x-2)^2+(y-5)^2=16$ and $(x-2)^2+(y-5)^2=25$

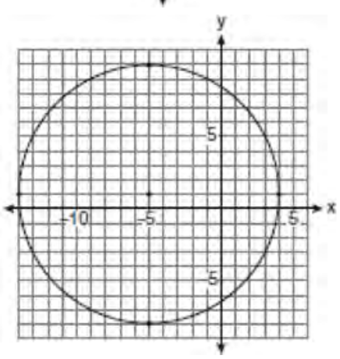
399 A circle has the equation $(x-3)^2+(y+4)^2=10$. Find the coordinates of the center of the circle and the length of the circle's radius.

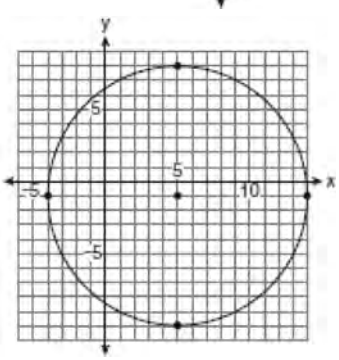
G.G.74: GRAPHING CIRCLES

400 Which graph represents a circle with the equation $(x-5)^2+(y+1)^2=9$?

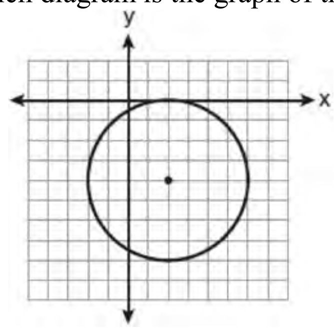
1 

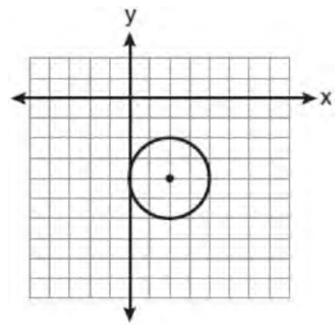
2 

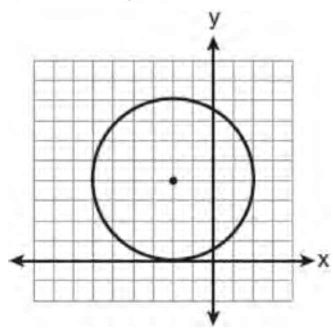
3 

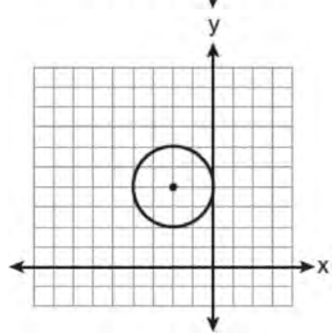
4 

401 The equation of a circle is $(x-2)^2+(y+4)^2=4$. Which diagram is the graph of the circle?

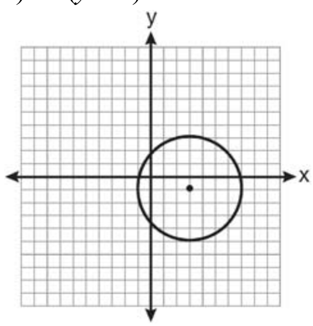
1 

2 

3 

4 

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



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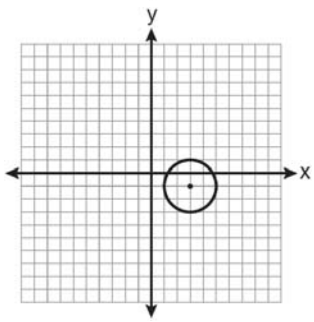

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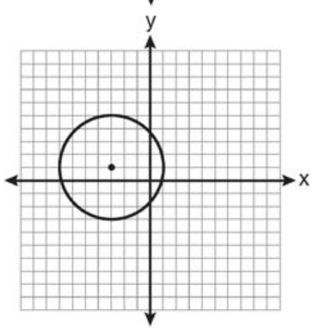

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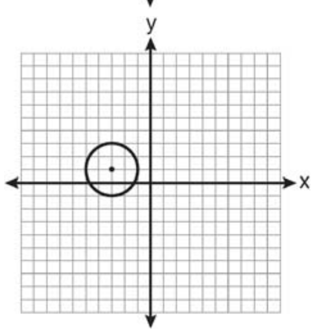
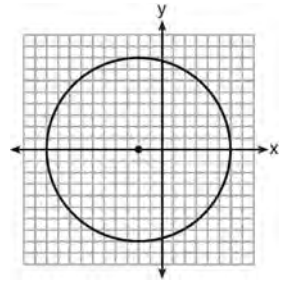


4

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



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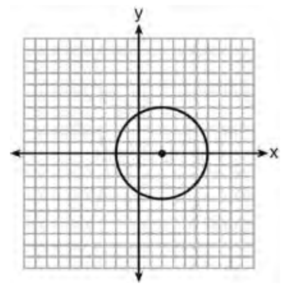

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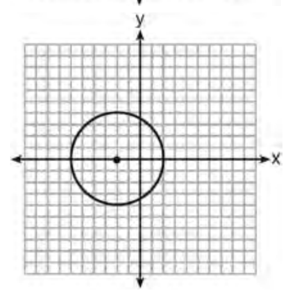

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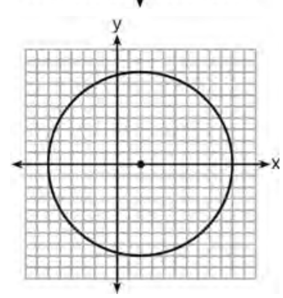
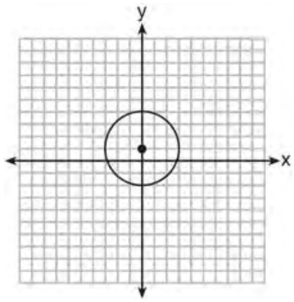


4

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



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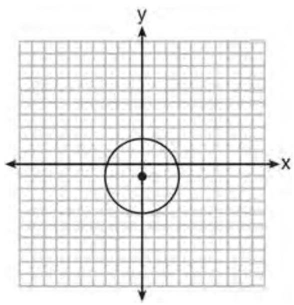

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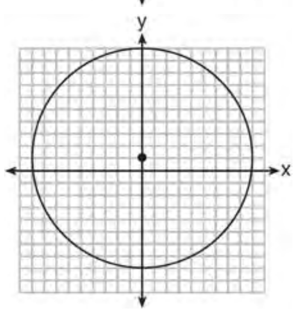

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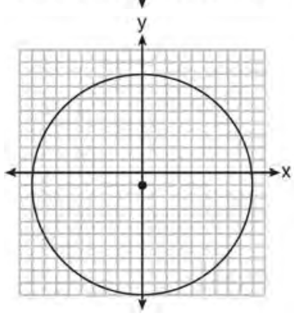
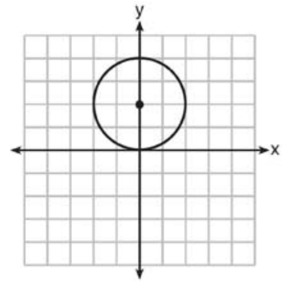
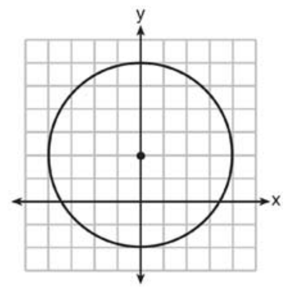


4

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



1



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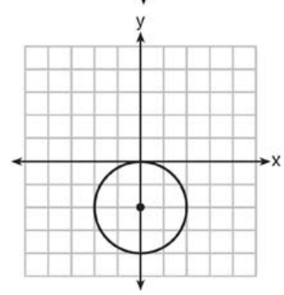

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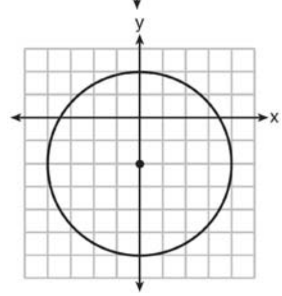


4

Geometry Regents Exam Questions by Performance Indicator: Topic

MEASURING IN THE PLANE AND SPACE

G.G.11: VOLUME

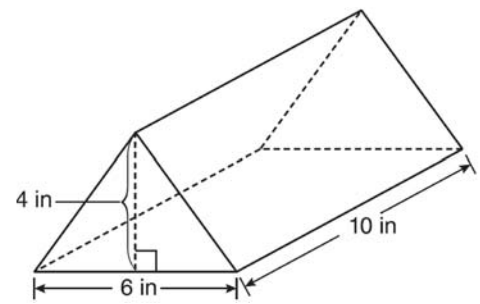
406 A rectangular prism has a base with a length of 25, a width of 9, and a height of 12. A second prism has a square base with a side of 15. If the volumes of the two prisms are equal, what is the height of the second prism?
1 6
2 8
3 12
4 15

407 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

408 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.

G.G.12: VOLUME

409 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

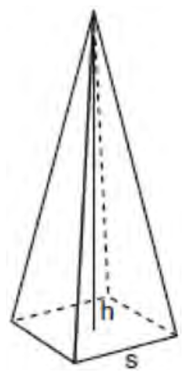
410 The volume of a rectangular prism is 144 cubic inches. The height of the prism is 8 inches. Which measurements, in inches, could be the dimensions of the base?
1 3.3 by 5.5
2 2.5 by 7.2
3 12 by 8
4 9 by 9

411 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 $x^2 + 6x + 8$

412 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.

G.G.13: VOLUME

413 A regular pyramid with a square base is shown in the diagram below.

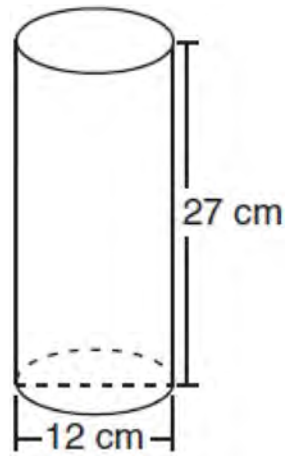


A side, s, of the base of the pyramid is 12 meters, and the height, h, is 42 meters. What is the volume of the pyramid in cubic meters?

414 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 cm^3.

G.G.14: VOLUME AND LATERAL AREA

415 Which expression represents the volume, in cubic centimeters, of the cylinder represented in the diagram below?



1 162π
2 324π
3 972π
4 $3,888\pi$

416 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 $2,160\pi$

417 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.

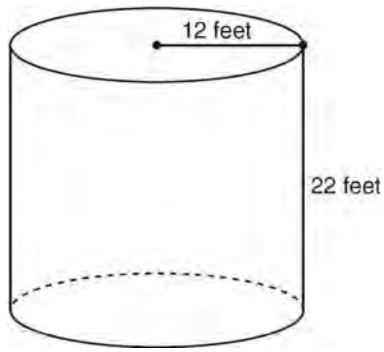
418 A right circular cylinder has a volume of 1,000 cubic inches and a height of 8 inches. What is the radius of the cylinder to the *nearest tenth of an inch*?
1 6.3
2 11.2
3 19.8
4 39.8

419 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*.

420 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

421 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.

422 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?

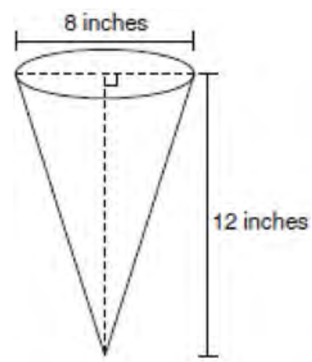


423 A right circular cylinder with a height of 5 cm has a base with a diameter of 6 cm. Find the lateral area of the cylinder to the *nearest hundredth of a square centimeter*. Find the volume of the cylinder to the *nearest hundredth of a cubic centimeter*.

424 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.

G.G.15: VOLUME AND LATERAL AREA

425 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

426 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.

427 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

G.G.16: VOLUME AND SURFACE AREA

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

429 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

430 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

431 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

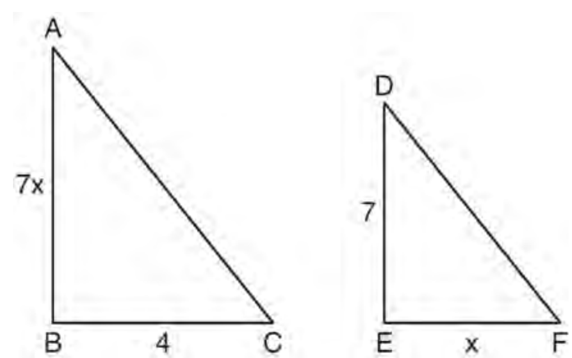
432 A sphere has a diameter of 18 meters. Find the volume of the sphere, in cubic meters, in terms of π.

433 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*.

434 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

G.G.45: SIMILARITY

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



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

436 If $\Delta ABC \sim \Delta ZXY$, m$\angle A = 50$, and m$\angle C = 30$, what is m$\angle X$?
1 30
2 50
3 80
4 100

437 Triangle *ABC* is similar to triangle *DEF*. The lengths of the sides of ΔABC are 5, 8, and 11. What is the length of the shortest side of ΔDEF if its perimeter is 60?
1 10
2 12.5
3 20
4 27.5

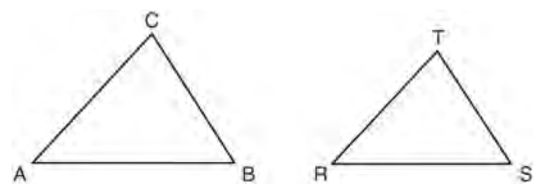
438 Two triangles are similar, and the ratio of each pair of corresponding sides is 2:1. Which statement regarding the two triangles is *not* true?
1 Their areas have a ratio of 4:1.
2 Their altitudes have a ratio of 2:1.
3 Their perimeters have a ratio of 2:1.
4 Their corresponding angles have a ratio of 2:1.

439 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

440 Given $\Delta ABC \sim \Delta DEF$ 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 $\frac{\text{area of } \Delta ABC}{\text{area of } \Delta DEF} = \frac{9}{4}$
4 $\frac{\text{perimeter of } \Delta ABC}{\text{perimeter of } \Delta DEF} = \frac{3}{2}$

441 ΔABC is similar to ΔDEF. 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 $\frac{\text{area of } \Delta ABC}{\text{area of } \Delta DEF}$
4 $\frac{\text{perimeter of } \Delta ABC}{\text{perimeter of } \Delta DEF}$

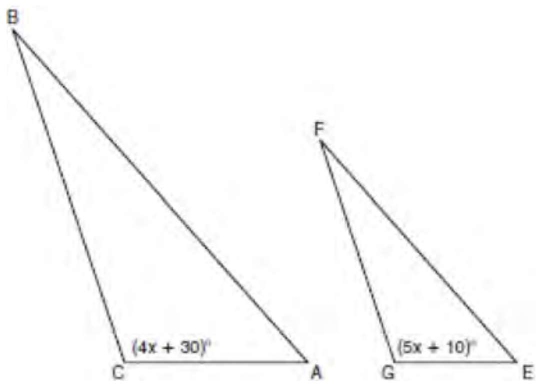
442 In the diagram below, $\Delta ABC \sim \Delta RST$.



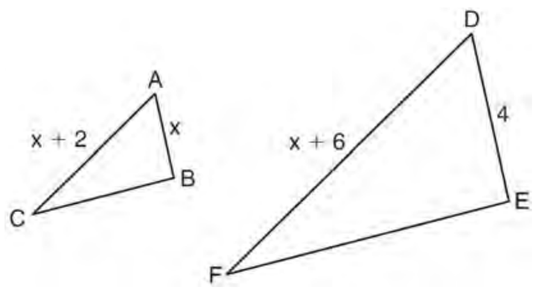
Which statement is *not* true?
1 $\angle A \cong \angle R$
2 $\frac{AB}{RS} = \frac{BC}{ST}$
3 $\frac{AB}{BC} = \frac{ST}{RS}$
4 $\frac{AB + BC + AC}{RS + ST + RT} = \frac{AB}{RS}$

443 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 $\angle ABC \cong \angle EDF$

444 In the diagram below, $\Delta ABC \sim \Delta EFG$, $m\angle C = 4x + 30$, and $m\angle G = 5x + 10$. Determine the value of x.



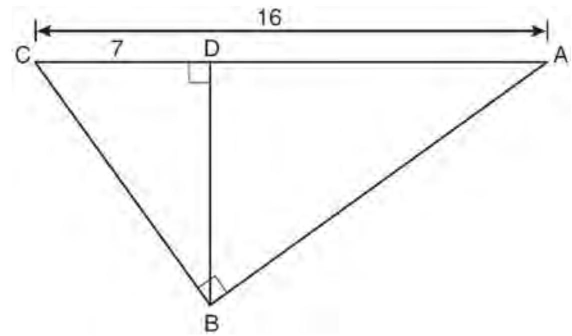
445 In the diagram below, $\Delta ABC \sim \Delta DEF$, $DE = 4$, $AB = x$, $AC = x + 2$, and $DF = x + 6$. Determine the length of $\overline{AB}$. [Only an algebraic solution can receive full credit.]



446 If $\Delta RST \sim \Delta ABC$, $m\angle A = x^2 - 8x$, $m\angle C = 4x - 5$, and $m\angle R = 5x + 30$, find $m\angle C$. [Only an algebraic solution can receive full credit.]

G.G.47: SIMILARITY

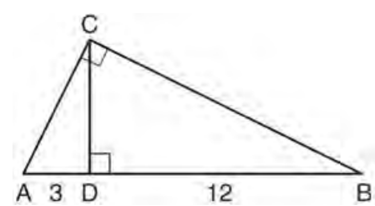
447 In the diagram below of right triangle ABC, altitude $\overline{BD}$ is drawn to hypotenuse $\overline{AC}$, $AC = 16$, and $CD = 7$.



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

1 $3\sqrt{7}$
2 $4\sqrt{7}$
3 $7\sqrt{3}$
4 12

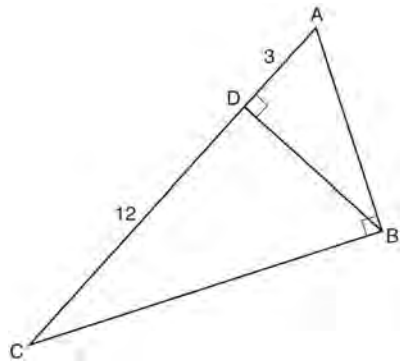
448 In the diagram below of right triangle ABC, altitude $\overline{CD}$ is drawn to hypotenuse $\overline{AB}$.



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

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

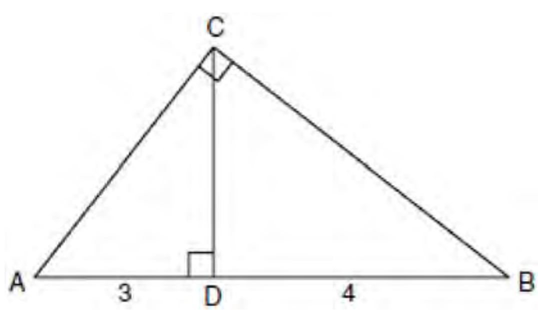
449 In right triangle ABC shown in the diagram below, altitude $\overline{BD}$ is drawn to hypotenuse $\overline{AC}$, $CD = 12$, and $AD = 3$.



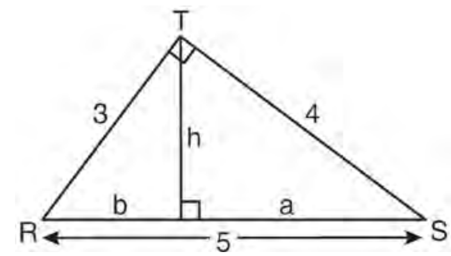
What is the length of $\overline{AB}$?

1 $5\sqrt{3}$
2 6
3 $3\sqrt{5}$
4 9

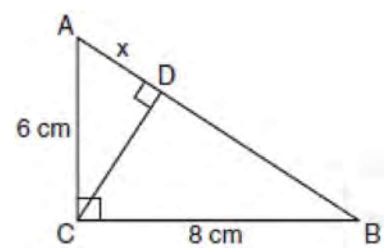
450 In the diagram below of right triangle ACB, altitude $\overline{CD}$ intersects $\overline{AB}$ at D. If $AD = 3$ and $DB = 4$, find the length of $\overline{CD}$ in simplest radical form.



451 In the diagram below, ΔRST is a $3-4-5$ right triangle. The altitude, h, to the hypotenuse has been drawn. Determine the length of h.



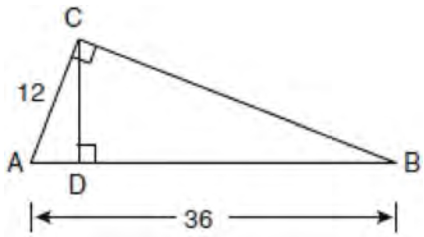
452 In the diagram below, the length of the legs $\overline{AC}$ and $\overline{BC}$ of right triangle ABC are 6 cm and 8 cm, respectively. Altitude $\overline{CD}$ is drawn to the hypotenuse of ΔABC.



What is the length of $\overline{AD}$ to the *nearest tenth of a centimeter*?

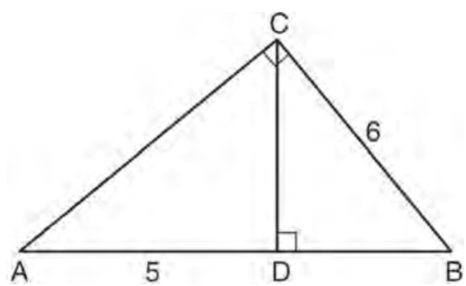
1 3.6
2 6.0
3 6.4
4 4.0

453 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

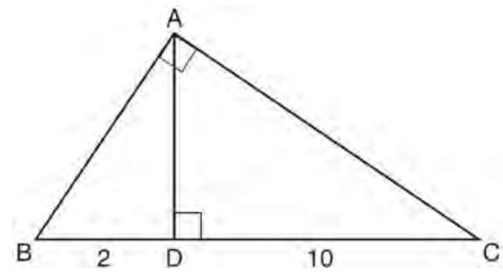
454 In the diagram below of right triangle ABC, $\overline{CD}$ is the altitude to hypotenuse $\overline{AB}$, $CB = 6$, and $AD = 5$.



What is the length of $\overline{BD}$?
1 5
2 9
3 3
4 4

455 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

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



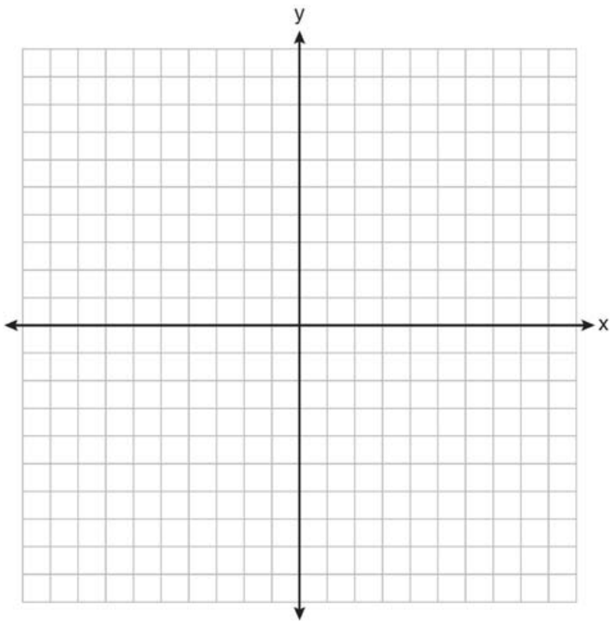
If $BD = 2$ and $DC = 10$, what is the length of $\overline{AB}$?
1 $2\sqrt{2}$
2 $2\sqrt{5}$
3 $2\sqrt{6}$
4 $2\sqrt{30}$

TRANSFORMATIONS

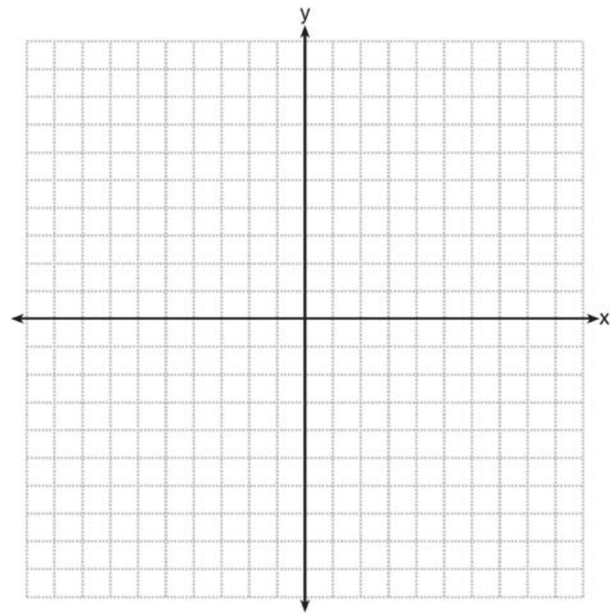
G.G.54: ROTATIONS

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

458 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.]



459 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.]



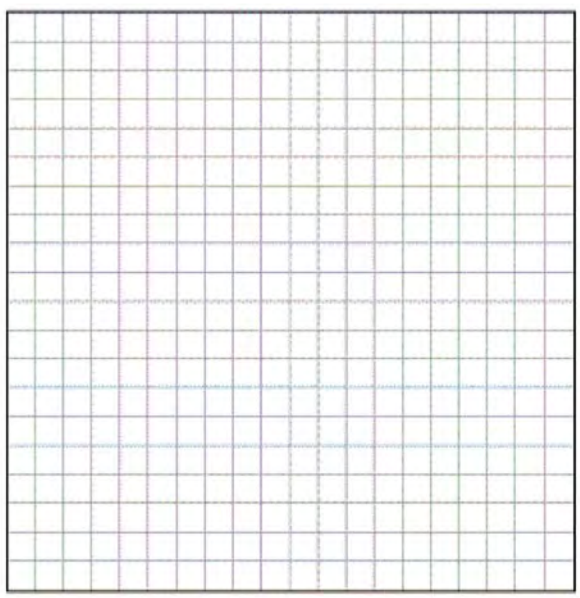
G.G.54: REFLECTIONS

460 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 $(7,-4)$

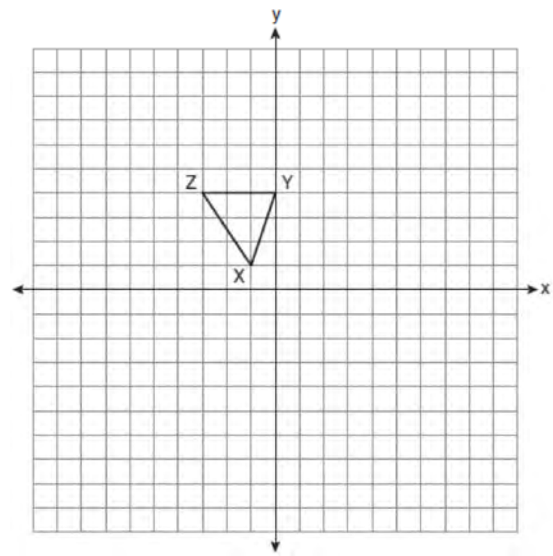
461 What is the image of the point $(2,-3)$ after the transformation $r_{y-\text{axis}}$?
1 $(2,3)$
2 $(-2,-3)$
3 $(-2,3)$
4 $(-3,2)$

462 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 $(-4b, -3a)$

463 Triangle ABC has vertices $A(-2, 2)$, $B(-1, -3)$, and $C(4, 0)$. Find the coordinates of the vertices of $\Delta A'B'C'$, the image of ΔABC after the transformation $r_{\text{x-axis}}$. [The use of the grid is optional.]



464 Triangle XYZ, shown in the diagram below, is reflected over the line $x = 2$. State the coordinates of $\Delta X'Y'Z'$, the image of ΔXYZ.

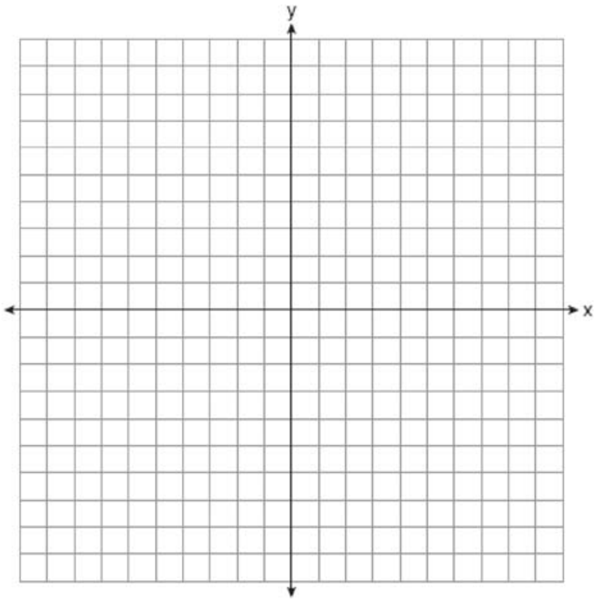


G.G.54: TRANSLATIONS

465 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 $(-15, -8)$

466 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 $(1, -1)$

467 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 $(x,y) \rightarrow (x-5, y-1)$.



G.G.58: DILATIONS

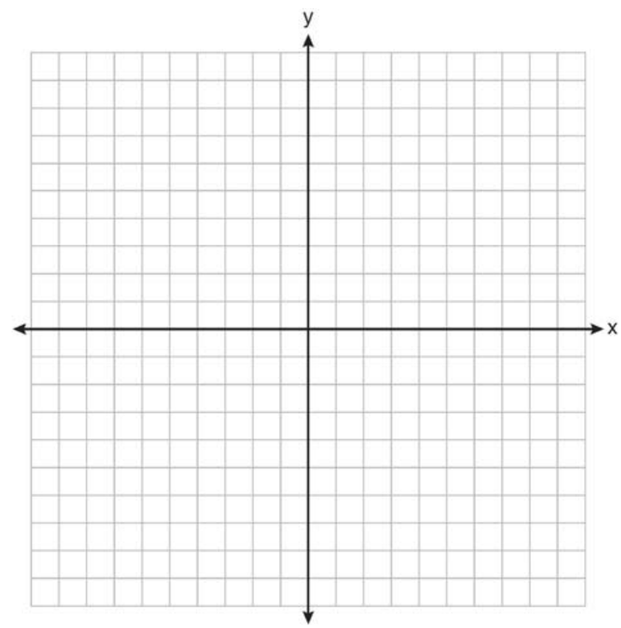
468 Triangle ABC has vertices $A(6,6)$, $B(9,0)$, and $C(3,-3)$. State and label the coordinates of $\triangle A'B'C'$, the image of $\triangle ABC$ after a dilation of $D_{\frac{1}{3}}$.

G.G.54: COMPOSITIONS OF TRANSFORMATIONS

469 What is the image of point $A(4,2)$ after the composition of transformations defined by $R_{90^\circ} \circ r_{y=x}$?
1 $(-4,2)$
2 $(4,-2)$
3 $(-4,-2)$
4 $(2,-4)$

470 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 $(-8,-12)$

471 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.]

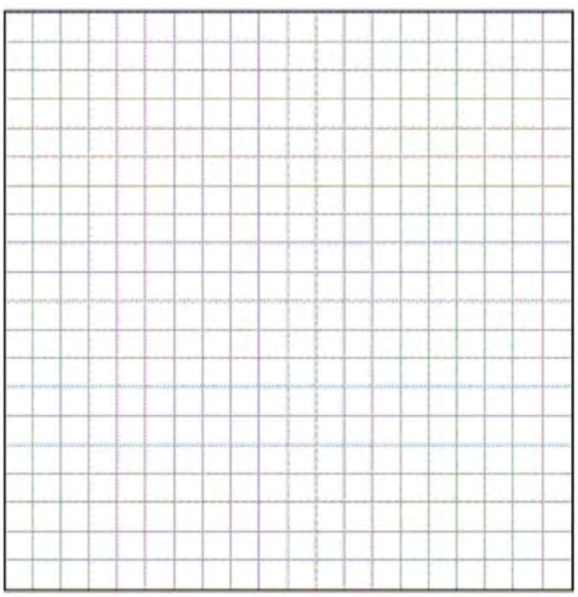


G.G.58: COMPOSITIONS OF TRANSFORMATIONS

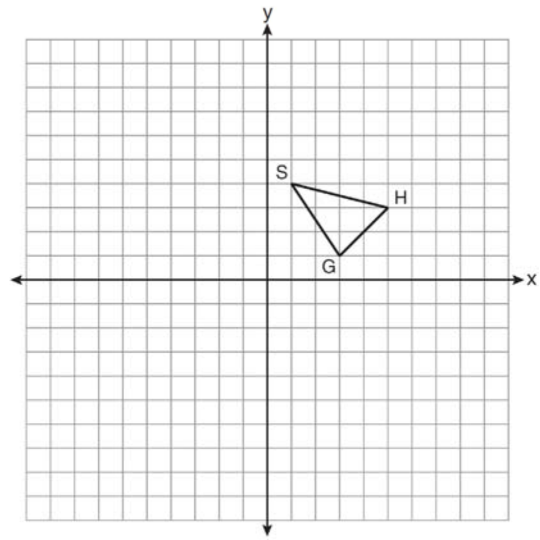
472 The endpoints of $\overline{AB}$ are $A(3,2)$ and $B(7,1)$. If $\overline{A''B''}$ is the result of the transformation of $\overline{AB}$ under $D_2 \circ T_{-4,3}$ what are the coordinates of A'' and B''?

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 $B''(22,-4)$

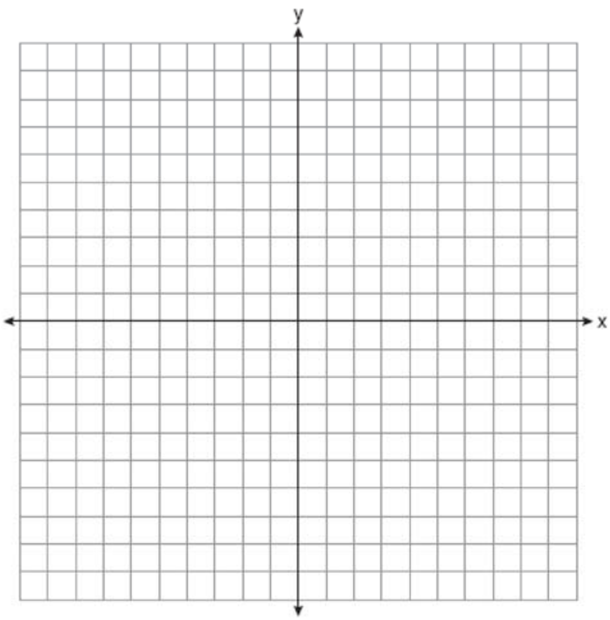
473 The coordinates of the vertices of $\triangle ABC$ $A(1,3)$, $B(-2,2)$ and $C(0,-2)$. On the grid below, graph and label $\triangle A''B''C''$, the result of the composite transformation $D_2 \circ T_{3,-2}$. State the coordinates of A'', B'', and C''.



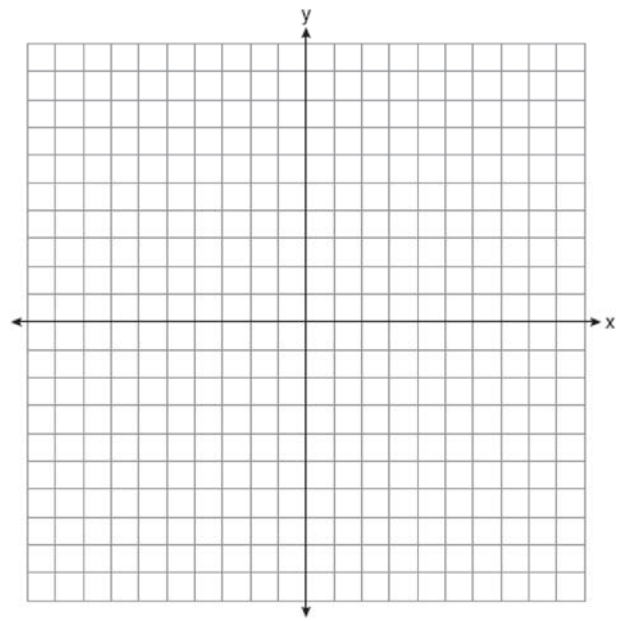
474 As shown on the set of axes below, $\triangle GHS$ has vertices $G(3,1)$, $H(5,3)$, and $S(1,4)$. Graph and state the coordinates of $\triangle G''H''S''$, the image of $\triangle GHS$ after the transformation $T_{-3,1} \circ D_2$.



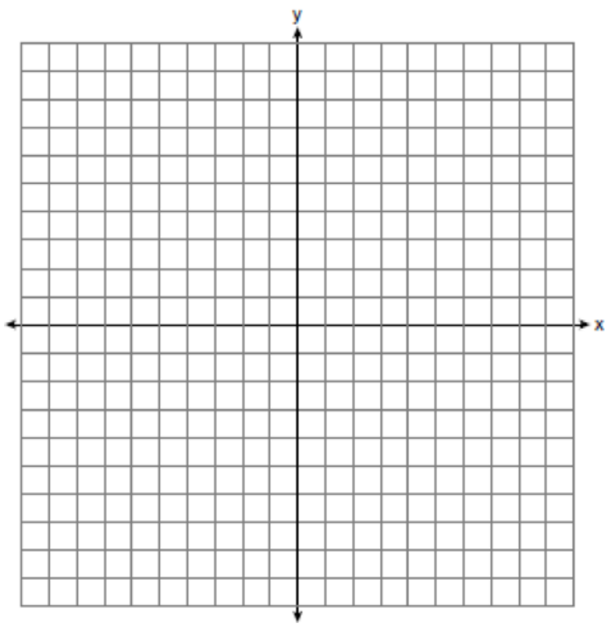
475 The coordinates of trapezoid $ABCD$ are $A(-4,5)$, $B(1,5)$, $C(1,2)$, and $D(-6,2)$. Trapezoid $A''B''C''D''$ is the image after the composition $r_{x-\text{axis}} \circ r_{y=x}$ is performed on trapezoid $ABCD$. State the coordinates of trapezoid $A''B''C''D''$. [The use of the set of axes below is optional.]



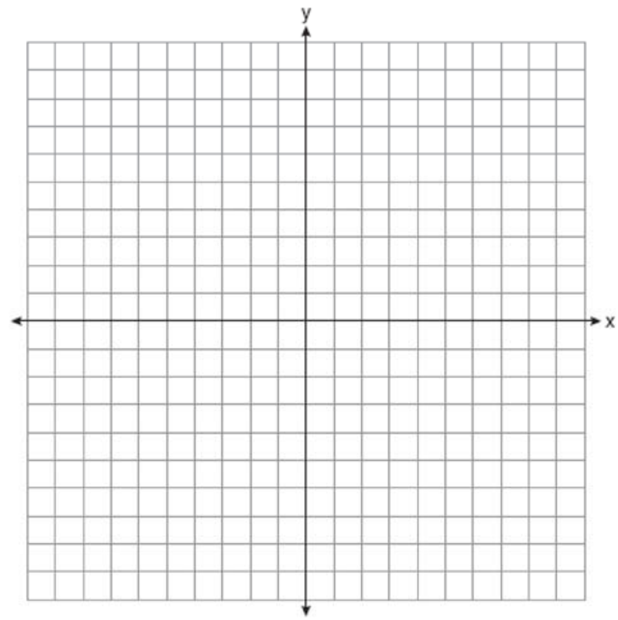
476 The vertices of $\triangle RST$ are $R(-6,5)$, $S(-7,-2)$, and $T(1,4)$. The image of $\triangle RST$ after the composition $T_{-2,3} \circ r_{y=x}$ is $\triangle R''S''T''$. State the coordinates of $\triangle R''S''T''$. [The use of the set of axes below is optional.]



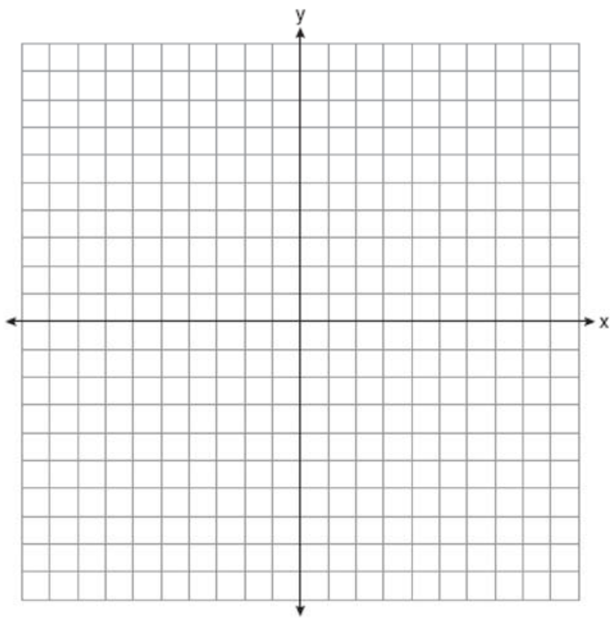
477 Triangle ABC has vertices $A(5,1)$, $B(1,4)$ and $C(1,1)$. State and label the coordinates of the vertices of $\triangle A''B''C''$, the image of $\triangle ABC$, following the composite transformation $T_{1,-1} \circ D_2$. [The use of the set of axes below is optional.]



478 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.]

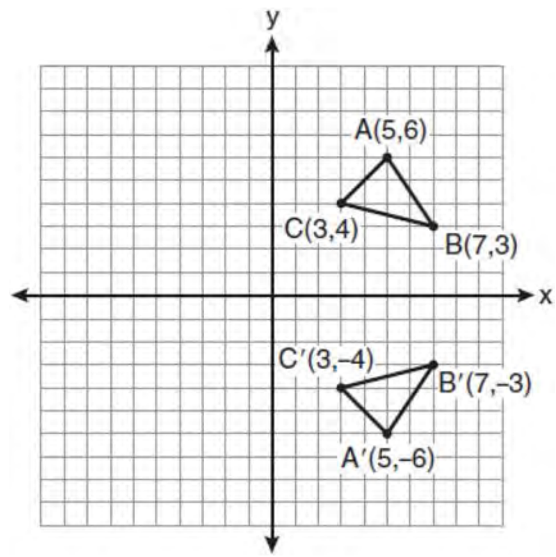


479 Quadrilateral *MATH* has coordinates $M(-6,-3)$, $A(-1,-3)$, $T(-2,-1)$, and $H(-4,-1)$. The image of quadrilateral *MATH* after the composition $r_{x\text{-axis}} \circ T_{7,5}$ is quadrilateral $M''A''T''H''$. State and label the coordinates of $M''A''T''H''$. [The use of the set of axes below is optional.]



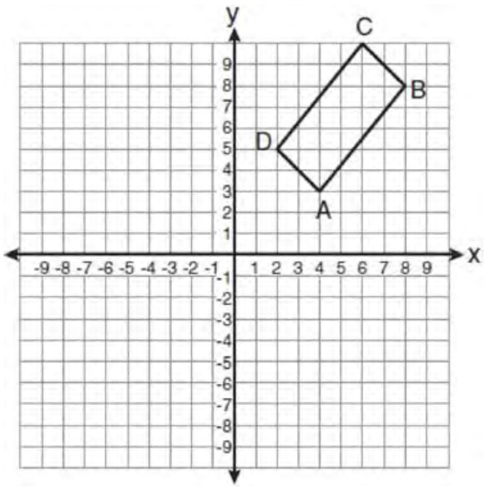
G.G.55: PROPERTIES OF TRANSFORMATIONS

480 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

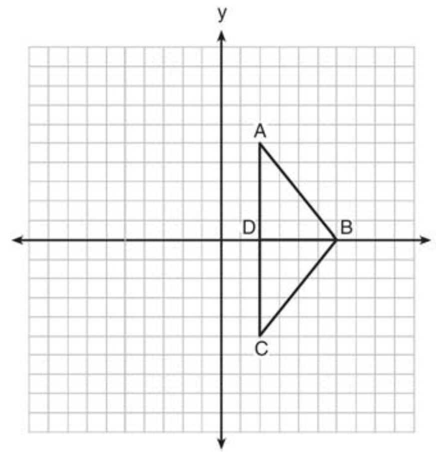
481 The rectangle *ABCD* shown in the diagram below will be reflected across the *x*-axis.



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 $\angle A$

482 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.

483 A transformation of a polygon that always preserves both length and orientation is

1 dilation
2 translation
3 line reflection
4 glide reflection

484 When a quadrilateral is reflected over the line $y = x$, which geometric relationship is *not* preserved?

1 congruence
2 orientation
3 parallelism
4 perpendicularity

485 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 $\overline{N'O'}$

486 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 $\overline{T'P'}$

487 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?

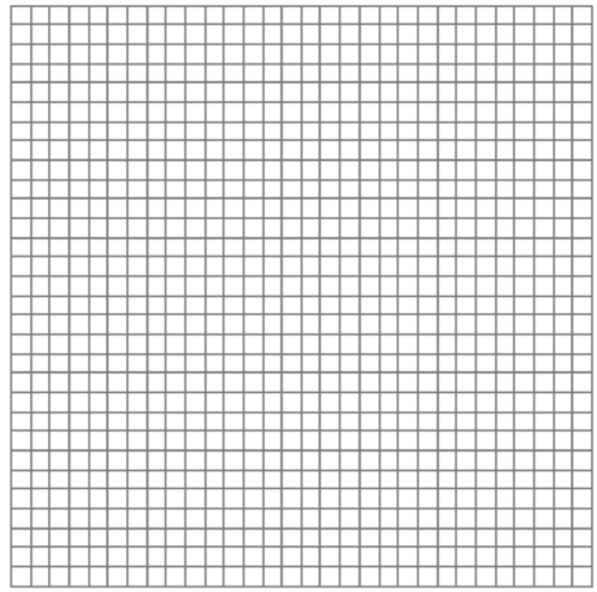
1 1
2 2
3 3
4 0

488 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

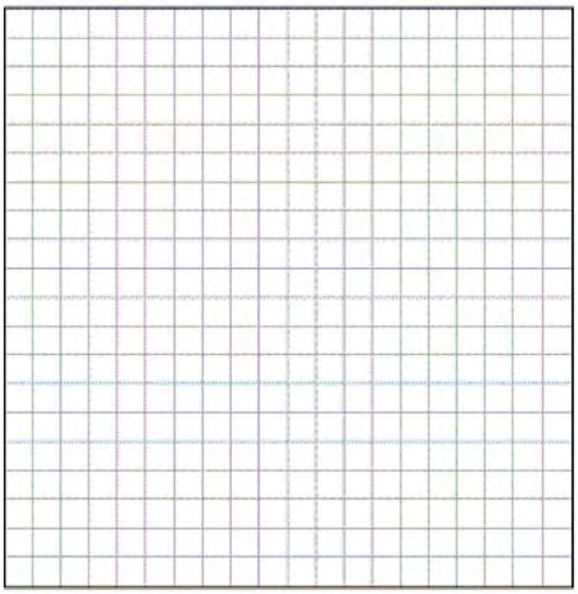
1 acute
2 isosceles
3 obtuse
4 right

489 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*.

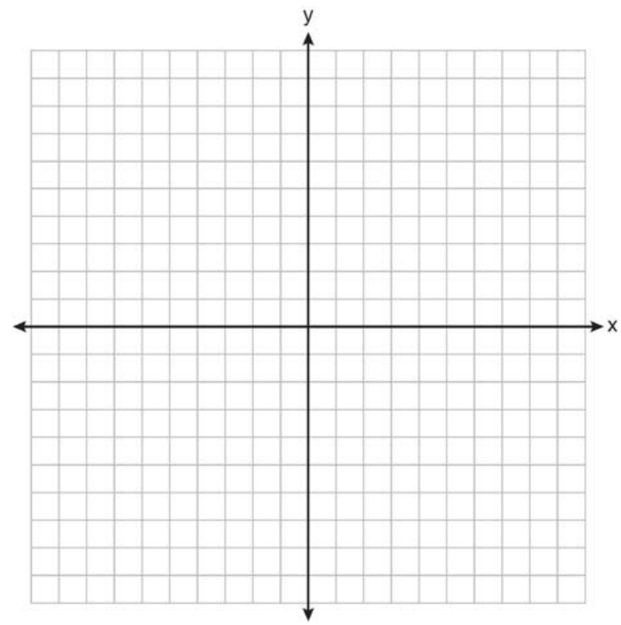
490 The vertices of $\triangle ABC$ are $A(3,2)$, $B(6,1)$, and $C(4,6)$. Identify and graph a transformation of $\triangle ABC$ such that its image, $\triangle A'B'C'$, results in $\overline{AB} \parallel \overline{A'B'}$.



491 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.



492 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.

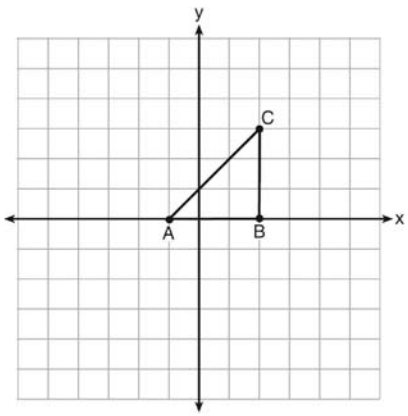


G.G.57: PROPERTIES OF TRANSFORMATIONS

493 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 $r_{x = 1}$

G.G.59: PROPERTIES OF TRANSFORMATIONS

494 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}

495 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

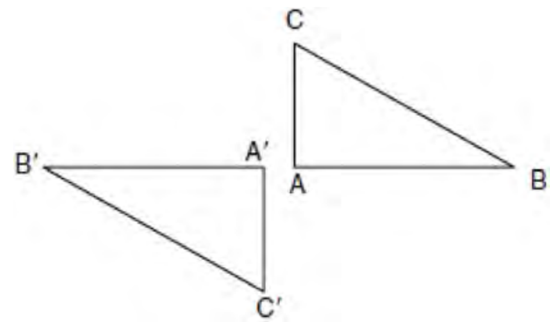
496 When $\triangle ABC$ is dilated by a scale factor of 2, its image is $\triangle A'B'C'$. Which statement is true?

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 $\triangle A'B'C'$

497 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.

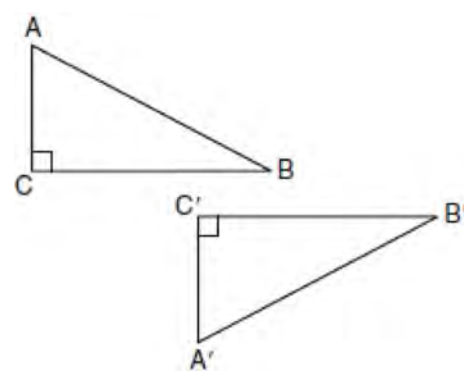
G.G.56: IDENTIFYING TRANSFORMATIONS

498 In the diagram below, under which transformation will $\triangle A'B'C'$ be the image of $\triangle ABC$?



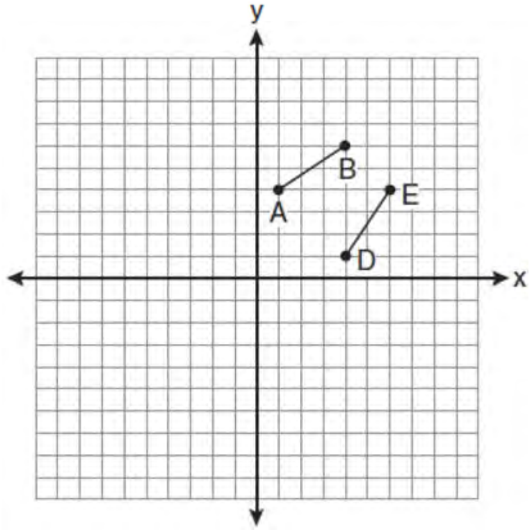
1 rotation
2 dilation
3 translation
4 glide reflection

499 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

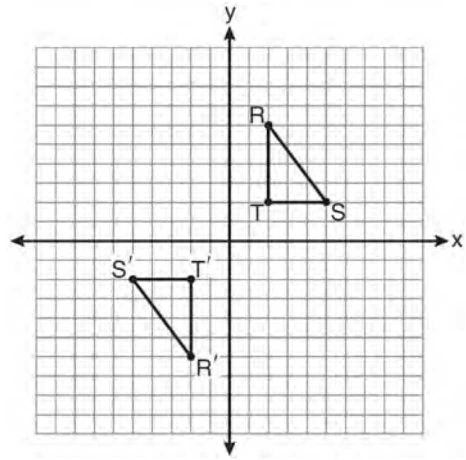
500 The diagram below shows $\overline{AB}$ and $\overline{DE}$.



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 $r_{y=x}$

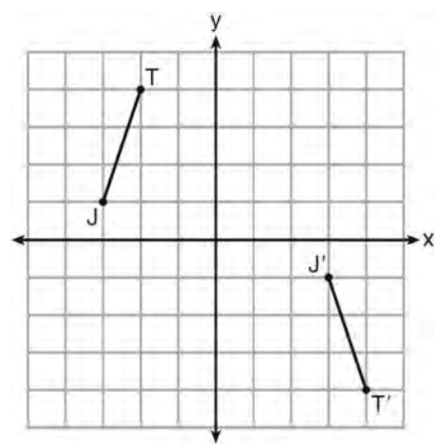
501 As shown on the graph below, $\Delta R'S'T'$ is the image of ΔRST under a single transformation.



Which transformation does this graph represent?

1 glide reflection
2 line reflection
3 rotation
4 translation

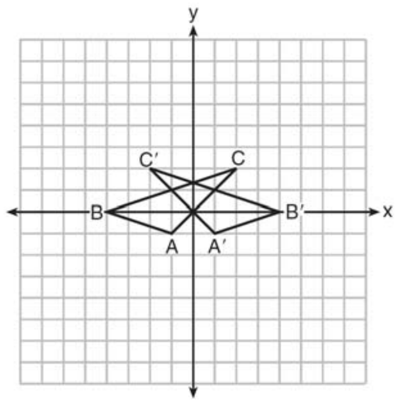
502 The graph below shows $\overline{JT}$ and its image, $\overline{J'T'}$, after a transformation.



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

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

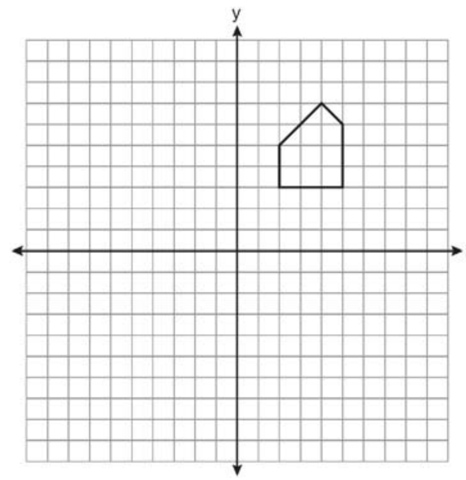


1 D_2
2 $r_{x\text{-axis}}$
3 $r_{y\text{-axis}}$
4 $(x,y) \to (x-2,y)$

504 Which transformation is *not* always an isometry?
1 rotation
2 dilation
3 reflection
4 translation

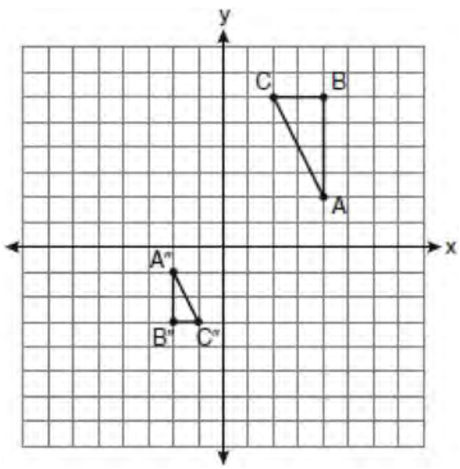
505 Which transformation can map the letter S onto itself?
1 glide reflection
2 translation
3 line reflection
4 rotation

506 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.]



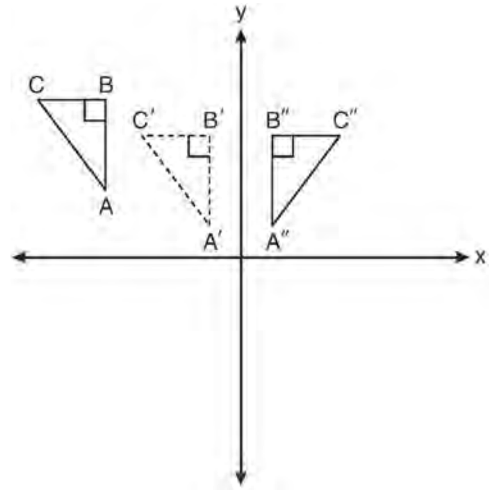
G.G.60: IDENTIFYING TRANSFORMATIONS

507 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 $D_{\frac{1}{2}} \circ R_{90^\circ}$

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



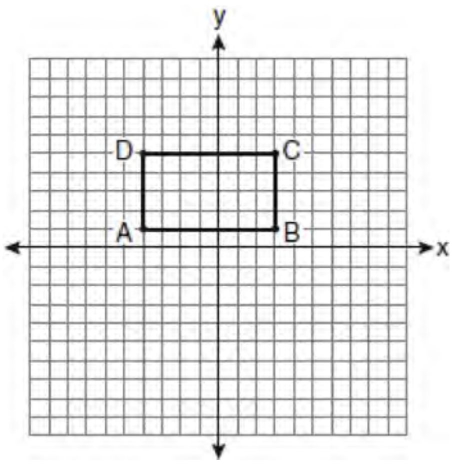
The composite transformation of $\triangle ABC$ to $\triangle A''B''C''$ is an example of a
1 reflection followed by a rotation
2 reflection followed by a translation
3 translation followed by a rotation
4 translation followed by a reflection

509 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 $r_{y=x}$

G.G.61: ANALYTICAL REPRESENTATIONS OF TRANSFORMATIONS

510 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

511 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.



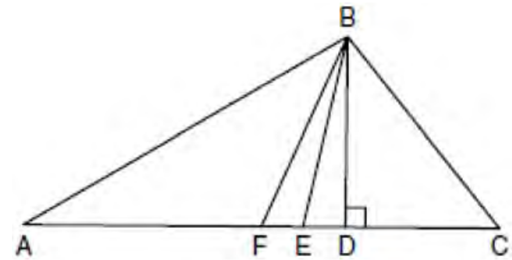
What will be the area of the rectangle after these transformations?

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.

LOGIC

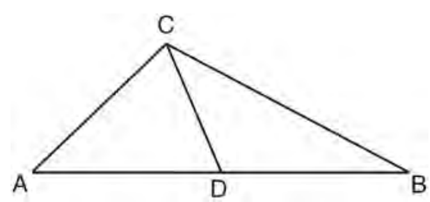
G.G.24: STATEMENTS AND NEGATIONS

512 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 $\overline{CF} \cong \overline{FA}$

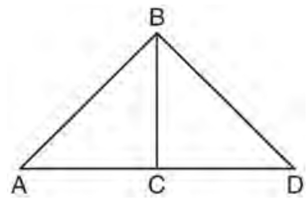
513 As shown in the diagram below, $\overline{CD}$ is a median of $\triangle ABC$.



Which statement is *always* true?

1 $\overline{AD} \cong \overline{DB}$
2 $\overline{AC} \cong \overline{AD}$
3 $\angle ACD \cong \angle CDB$
4 $\angle BCD \cong \angle ACD$

514 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 $\triangle ABC \cong \triangle DBC$

515 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.

516 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.

517 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.

518 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

519 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

520 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

521 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.

522 Write the negation of the statement “2 is a prime number,” and determine the truth value of the negation.

G.G.25: COMPOUND STATEMENTS

523 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.

524 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

525 Given: Two is an even integer or three is an even integer.
Determine the truth value of this disjunction. Justify your answer.

G.G.26: CONDITIONAL STATEMENTS

526 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.

527 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.

528 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.

529 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.

530 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.

531 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.

532 Consider the relationship between the two statements below.

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

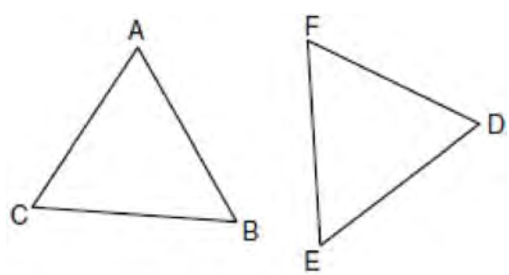
If $\sqrt{16+9} = 4+3$, then $5 = 4+3$

These statements are
1 inverses
2 converses
3 contrapositives
4 biconditionals

533 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.

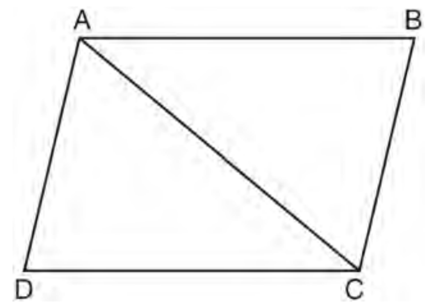
G.G.28: TRIANGLE CONGRUENCY

534 In the diagram of $\triangle ABC$ and $\triangle DEF$ below, $\overline{AB} \cong \overline{DE}$, $\angle A \cong \angle D$, and $\angle B \cong \angle E$.



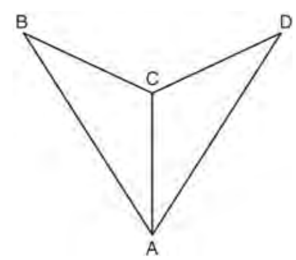
Which method can be used to prove $\triangle ABC \cong \triangle DEF$?
1 SSS
2 SAS
3 ASA
4 HL

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



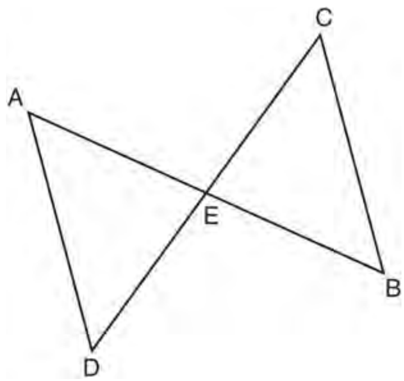
Which method can be used to prove $\triangle ABC$ is congruent to $\triangle CDA$?
1 AAS
2 SSA
3 SAS
4 SSS

536 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

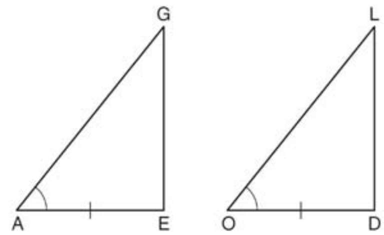
537 In the diagram below of $\triangle DAE$ and $\triangle BCE$, $\overline{AB}$ and $\overline{CD}$ intersect at E, such that $\overline{AE} \cong \overline{CE}$ and $\angle BCE \cong \angle DAE$.



Triangle DAE can be proved congruent to triangle BCE by
1 ASA
2 SAS
3 SSS
4 HL

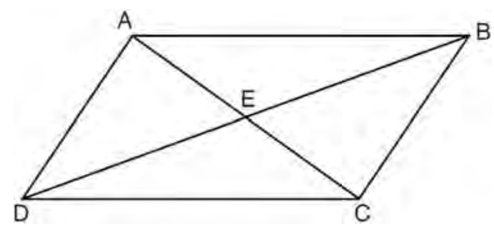
538 The diagonal $\overline{AC}$ is drawn in parallelogram $ABCD$. Which method can *not* be used to prove that $\triangle ABC \cong \triangle CDA$?
1 SSS
2 SAS
3 SSA
4 ASA

539 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 $\angle AEG \cong \angle ODL$

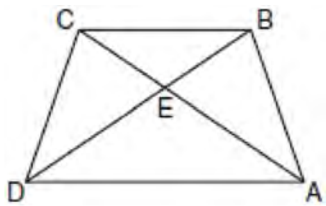
540 In parallelogram $ABCD$ shown below, diagonals $\overline{AC}$ and $\overline{BD}$ intersect at E.



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

G.G.29: TRIANGLE CONGRUENCY

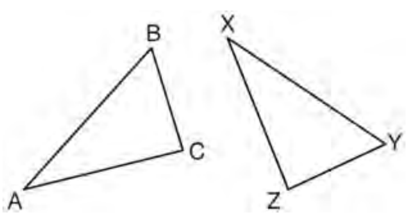
541 In the diagram of trapezoid $ABCD$ below, diagonals $\overline{AC}$ and $\overline{BD}$ intersect at E and $\triangle ABC \cong \triangle DCB$.



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 $\angle CDB \cong \angle BAC$

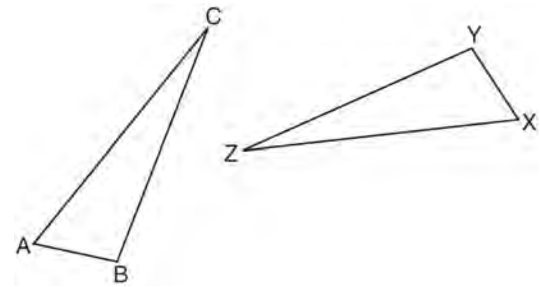
542 In the diagram below, $\triangle ABC \cong \triangle XYZ$.



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 $\angle A \cong \angle X$

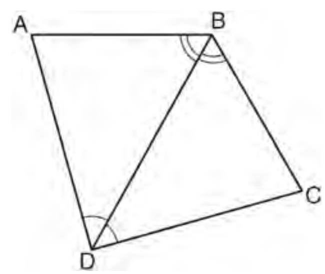
543 In the diagram below, $\triangle ABC \cong \triangle XYZ$.



Which statement must be true?

1 $\angle C \cong \angle Y$
2 $\angle A \cong \angle X$
3 $\overline{AC} \cong \overline{YZ}$
4 $\overline{CB} \cong \overline{XZ}$

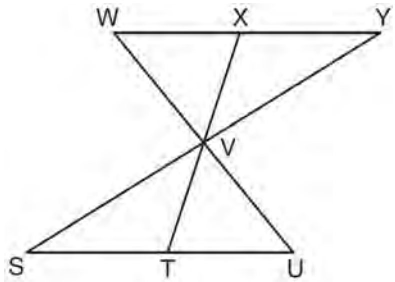
544 The diagram below shows a pair of congruent triangles, with $\angle ADB \cong \angle CDB$ and $\angle ABD \cong \angle CBD$.



Which statement must be true?

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

545 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 $\overline{YV} \cong \overline{SV}$

546 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 $\overline{JK} \cong \overline{ON}$

547 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 $\overline{RS}$

548 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 $\overline{NP}$

G.G.27: LINE PROOFS

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

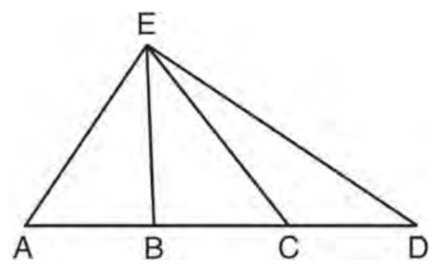
Using this information, it could be proven that
1 $BC = AB$
2 $AB = CD$
3 $AD - BC = CD$
4 $AB + CD = AD$

G.G.27: ANGLE PROOFS

550 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

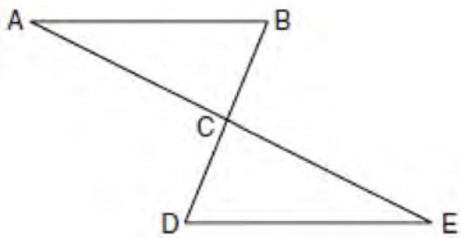
G.G.27: TRIANGLE PROOFS

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

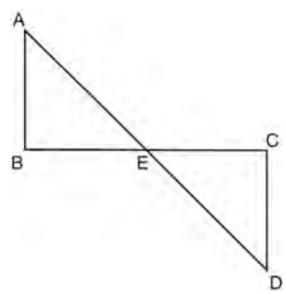


If $\overline{AB} \cong \overline{CD}$, which statement could always be proven?
1 $\overline{AC} \cong \overline{DB}$
2 $\overline{AE} \cong \overline{ED}$
3 $\overline{AB} \cong \overline{BC}$
4 $\overline{EC} \cong \overline{EA}$

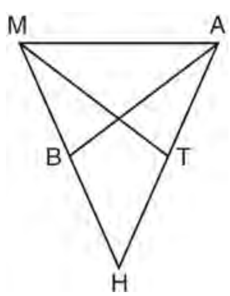
552 Given: $\triangle ABC$ and $\triangle EDC$, C is the midpoint of $\overline{BD}$ and $\overline{AE}$
Prove: $\overline{AB} \parallel \overline{DE}$



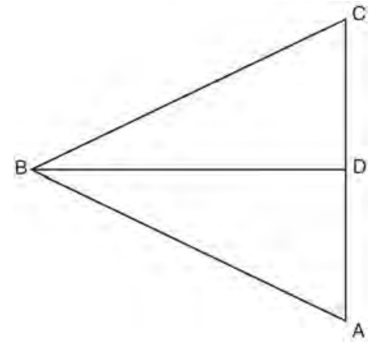
553 Given: $\overline{AD}$ bisects $\overline{BC}$ at E.
$\overline{AB} \perp \overline{BC}$
$\overline{DC} \perp \overline{BC}$
Prove: $\overline{AB} \cong \overline{DC}$



554 In the diagram of $\triangle MAH$ below, $\overline{MH} \cong \overline{AH}$ and medians $\overline{AB}$ and $\overline{MT}$ are drawn.
Prove: $\angle MBA \cong \angle ATM$

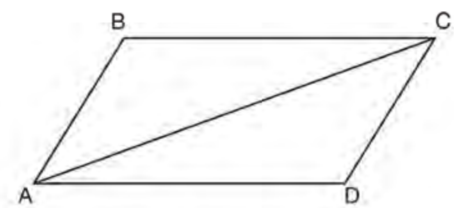


555 Given: $\triangle ABC$, $\overline{BD}$ bisects $\angle ABC$, $\overline{BD} \perp \overline{AC}$
Prove: $\overline{AB} \cong \overline{CB}$



G.G.27: QUADRILATERAL PROOFS

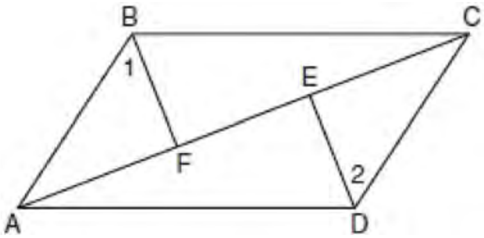
556 Given that $ABCD$ is a parallelogram, a student wrote the proof below to show that a pair of its opposite angles are congruent.



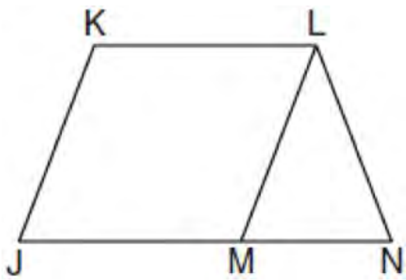
Statement	Reason
1. ABCD is a parallelogram.	1. Given
2. $\overline{BC} \cong \overline{AD}$ $\overline{AB} \cong \overline{DC}$	2. Opposite sides of a parallelogram are congruent.
3. $\overline{AC} \cong \overline{CA}$	3. Reflexive Postulate of Congruency
4. $\triangle ABC \cong \triangle CDA$	4. Side-Side-Side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

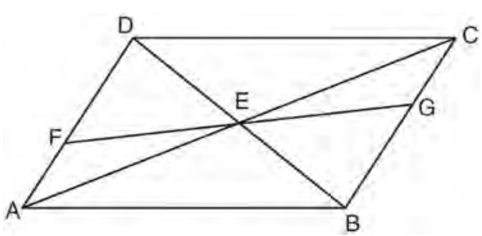
557 Given: Quadrilateral $ABCD$, diagonal $\overline{AFEC}$, $\overline{AE} \cong \overline{FC}$, $\overline{BF} \perp \overline{AC}$, $\overline{DE} \perp \overline{AC}$, $\angle 1 \cong \angle 2$
Prove: $ABCD$ is a parallelogram.



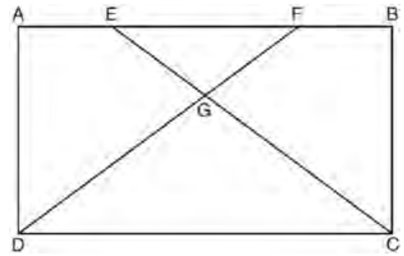
558 Given: $JKLM$ is a parallelogram.
$\overline{JM} \cong \overline{LN}$
$\angle LMN \cong \angle LNM$
Prove: $JKLM$ is a rhombus.



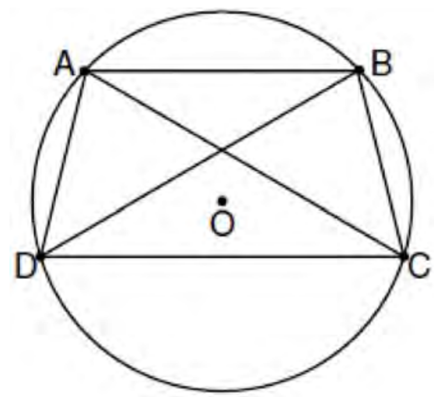
559 In the diagram below of quadrilateral $ABCD$, $\overline{AD} \cong \overline{BC}$ and $\angle DAE \cong \angle BCE$. Line segments AC, DB, and FG intersect at E.
Prove: $\triangle AEF \cong \triangle CEG$



560 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: $\overline{AE} \cong \overline{BF}$

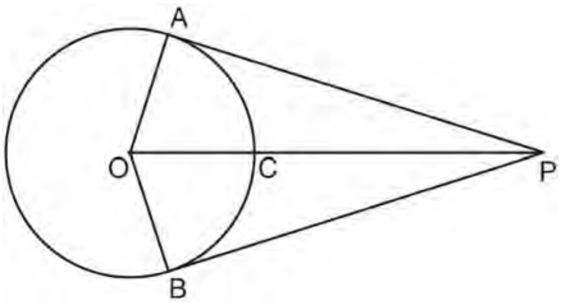


561 In the diagram below, quadrilateral $ABCD$ is inscribed in circle O, $\overline{AB} \parallel \overline{DC}$, and diagonals $\overline{AC}$ and $\overline{BD}$ are drawn. Prove that $\triangle ACD \cong \triangle BDC$.



G.G.27: CIRCLE PROOFS

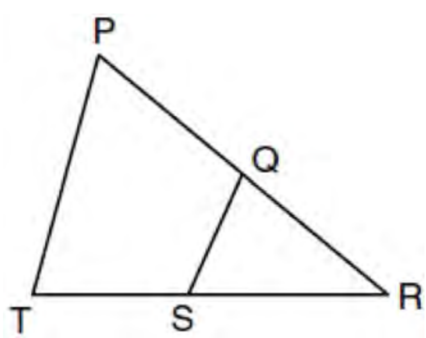
562 In the diagram below, $\overline{PA}$ and $\overline{PB}$ are tangent to circle O, $\overline{OA}$ and $\overline{OB}$ are radii, and $\overline{OP}$ intersects the circle at C. Prove: $\angle AOP \cong \angle BOP$



563 Given: Quadrilateral $ABCD$ with $\overline{AB} \cong \overline{CD}$, $\overline{AD} \cong \overline{BC}$, and diagonal $\overline{BD}$ is drawn
Prove: $\angle BDC \cong \angle ABD$

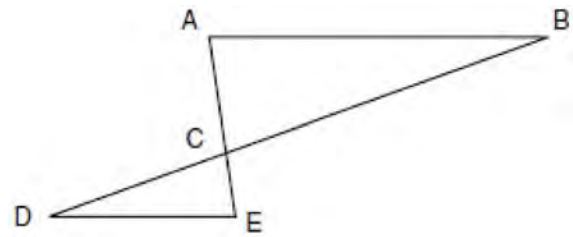
G.G.44: SIMILARITY PROOFS

564 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 $\angle RPT \cong \angle RSQ$.



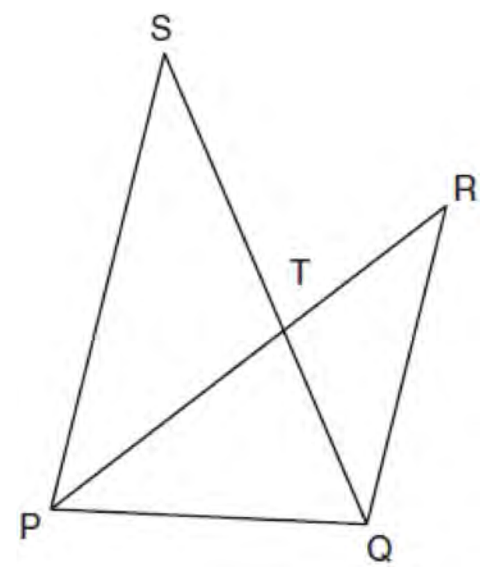
Which reason justifies the conclusion that $\triangle PRT \sim \triangle SRQ$?
1 AA
2 ASA
3 SAS
4 SSS

565 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

566 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

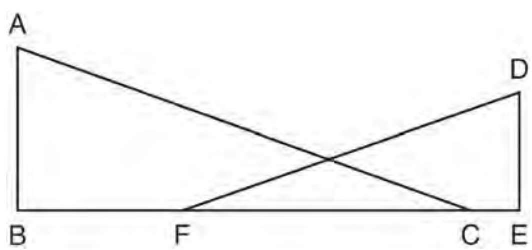
567 In triangles ABC and DEF, $AB = 4$, $AC = 5$, $DE = 8$, $DF = 10$, and $\angle A \cong \angle D$. Which method could be used to prove $\triangle ABC \sim \triangle DEF$?

1 AA
2 SAS
3 SSS
4 ASA

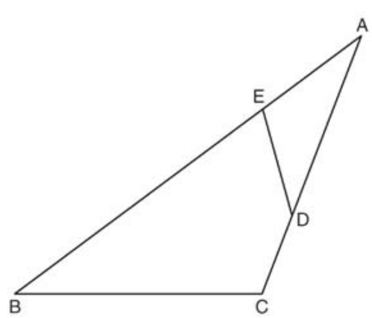
568 In $\triangle ABC$ and $\triangle DEF$, $\frac{AC}{DF} = \frac{CB}{FE}$. Which additional information would prove $\triangle ABC \sim \triangle DEF$?

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

569 In the diagram below, $\overline{BFCE}$, $\overline{AB} \perp \overline{BE}$, $\overline{DE} \perp \overline{BE}$, and $\angle BFD \cong \angle ECA$. Prove that $\triangle ABC \sim \triangle DEF$.



570 The diagram below shows $\triangle ABC$, with $\overline{AEB}$, $\overline{ADC}$, and $\angle ACB \cong \angle AED$. Prove that $\triangle ABC$ is similar to $\triangle ADE$.



Geometry Regents Exam Questions by Performance Indicator: Topic
Answer Section

1 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

2 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

3 ANS: 3

$m = \frac{-A}{B} = -\frac{3}{4}$

PTS: 2 REF: 011025ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

4 ANS: 2 PTS: 2 REF: 061022ge STA: G.G.62
TOP: Parallel and Perpendicular Lines

5 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

6 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

7 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

8 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

9 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

10 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

11 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

12 ANS: 4

$$3y + 1 = 6x + 4 \qquad 2y + 1 = x - 9$$
$$3y = 6x + 3 \qquad 2y = x - 10$$
$$y = 2x + 1 \qquad y = \frac{1}{2}x - 5$$

PTS: 2 REF: fall0822ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

13 ANS: 2

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

PTS: 2 REF: 081014ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

14 ANS: 1 PTS: 2 REF: 061113ge STA: G.G.63

TOP: Parallel and Perpendicular Lines

15 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

16 ANS: 4

$$\begin{aligned} 3y+6&=2x & 2y-3x&=6 \\ 3y&=2x-6 & 2y&=3x+6 \\ y&=\frac{2}{3}x-2 & y&=\frac{3}{2}x+3 \\ m&=\frac{2}{3} & m&=\frac{3}{2} \end{aligned}$$

PTS: 2 REF: 081315ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

17 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

18 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

19 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

20 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

21 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

22 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

23 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

24 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

25 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

26 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

27 ANS: 3 PTS: 2 REF: 011217ge STA: G.G.64
TOP: Parallel and Perpendicular Lines

28 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

29 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

30 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

31 ANS:

$y = \frac{2}{3}x + 1$. $2y + 3x = 6$. $y = mx + b$

$2y = -3x + 6$ $5 = \frac{2}{3}(6) + b$

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

$m = -\frac{3}{2}$ $1 = b$

$m_{\perp} = \frac{2}{3}$ $y = \frac{2}{3}x + 1$

PTS: 4 REF: 061036ge STA: G.G.64 TOP: Parallel and Perpendicular Lines

32 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

33 ANS: 4

The slope of a line in standard form is $-\frac{A}{B}$, so the slope of this line is $\frac{-4}{2} = -2$. 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

34 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

35 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

36 ANS: 2

$$m=\frac{-A}{B}=\frac{-4}{2}=-2 \quad y=mx+b$$
$$2=-2(2)+b$$
$$6=b$$

PTS: 2 REF: 081112ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

37 ANS: 3

$$y=mx+b$$
$$-1=2(2)+b$$
$$-5=b$$

PTS: 2 REF: 011224ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

38 ANS: 4

$$m=\frac{-A}{B}=\frac{-3}{2}. \quad y=mx+b$$
$$-1=\left(\frac{-3}{2}\right)(2)+b$$
$$-1=-3+b$$
$$2=b$$

PTS: 2 REF: 061226ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

39 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

40 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

41 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

42 ANS:

$y = \frac{2}{3}x - 9$. The slope of $2x - 3y = 11$ is $-\frac{A}{B} = \frac{-2}{-3} = \frac{2}{3}$. $-5 = \left(\frac{2}{3}\right)(6) + b$

$$-5 = 4 + b$$

$$b = -9$$

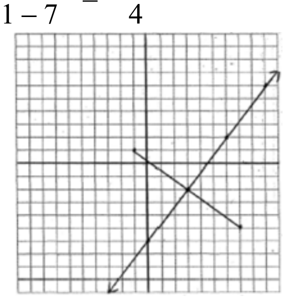
PTS: 2 REF: 080931ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

43 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 $\frac{4}{3}$.

$$M_y = \frac{1 + (-5)}{2} = -2$$

$$m = \frac{1 - (-5)}{-1 - 7} = -\frac{3}{4}$$

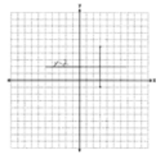


$y - y_M = m(x - x_M)$.

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

PTS: 4 REF: 080935ge STA: G.G.68 TOP: Perpendicular Bisector

44 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

45 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

46 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

47 ANS: 3

midpoint: $\left(\frac{6+8}{2}, \frac{8+4}{2} \right) = (7,6)$. slope: $\frac{8-4}{6-8} = \frac{4}{-2} = -2$; $m_{\perp} = \frac{1}{2}$. $6 = \frac{1}{2}(7) + b$

$\frac{12}{2} = \frac{7}{2} + b$

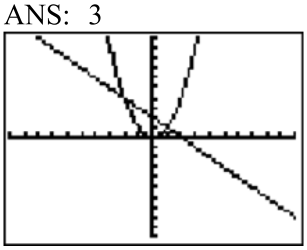
$\frac{5}{12} = b$

PTS: 2 REF: 081327ge STA: G.G.68 TOP: Perpendicular Bisector

48 ANS: 2 PTS: 2 REF: 061313ge STA: G.G.70

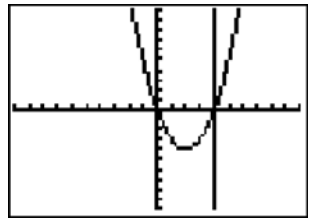
TOP: Quadratic-Linear Systems

49 ANS: 3



PTS: 2 REF: fall0805ge STA: G.G.70 TOP: Quadratic-Linear Systems

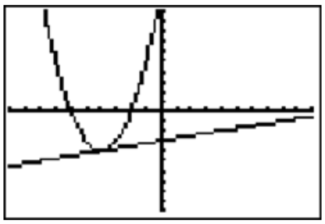
50 ANS: 1



$y = x^2 - 4x = (4)^2 - 4(4) = 0$. $(4, 0)$ is the only intersection.

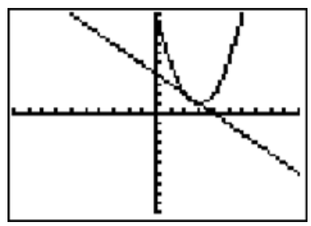
PTS: 2 REF: 060923ge STA: G.G.70 TOP: Quadratic-Linear Systems

51 ANS: 3



PTS: 2 REF: 061011ge STA: G.G.70 TOP: Quadratic-Linear Systems

52 ANS: 4



$y + x = 4$. $x^2 - 6x + 10 = -x + 4$. $y + x = 4$. $y + 2 = 4$

$y = -x + 4$ $\quad x^2 - 5x + 6 = 0$ $\quad y + 3 = 4$ $\quad y = 2$

$(x - 3)(x - 2) = 0$ $\quad y = 1$

$x = 3$ or 2

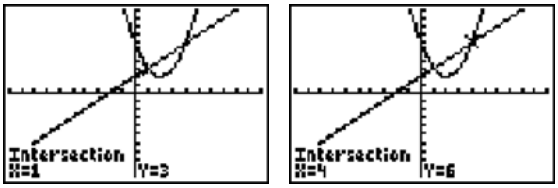
PTS: 2 REF: 080912ge STA: G.G.70 TOP: Quadratic-Linear Systems

53 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

54 ANS: 3



PTS: 2 REF: 081118ge STA: G.G.70 TOP: Quadratic-Linear Systems

55 ANS: 3

$x^2 + 5^2 = 25$

$x = 0$

PTS: 2 REF: 011312ge STA: G.G.70 TOP: Quadratic-Linear Systems

56 ANS: 2

$(x-4)^2 - 2 = -2x + 6$. $y = -2(4) + 6 = -2$

$x^2 - 8x + 16 - 2 = -2x + 6$ $y = -2(2) + 6 = 2$

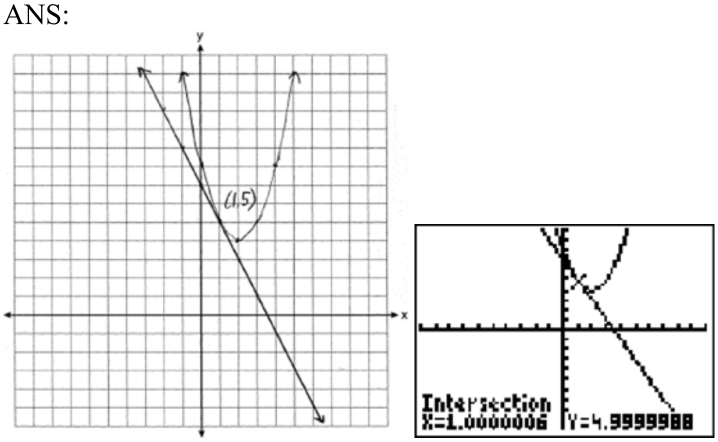
$x^2 - 6x + 8 = 0$

$(x-4)(x-2) = 0$

$x = 4, 2$

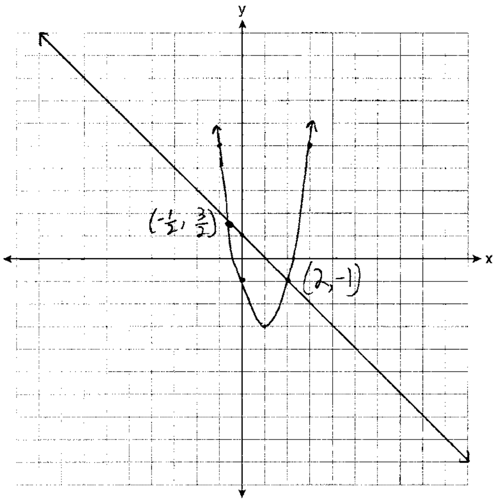
PTS: 2 REF: 081319ge STA: G.G.70 TOP: Quadratic-Linear Systems

57 ANS:



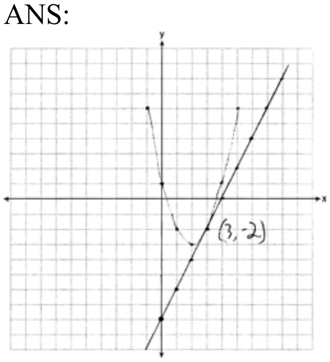
PTS: 6 REF: 011038ge STA: G.G.70 TOP: Quadratic-Linear Systems

58 ANS:



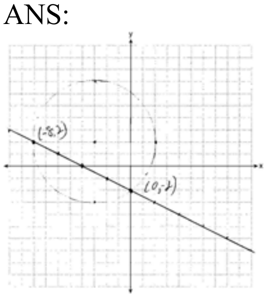
PTS: 4 REF: 061137ge STA: G.G.70 TOP: Quadratic-Linear Systems

59 ANS:



PTS: 6 REF: 061238ge STA: G.G.70 TOP: Quadratic-Linear Systems

60 ANS:



PTS: 4 REF: 081237ge STA: G.G.70 TOP: Quadratic-Linear Systems

61 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

62 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

63 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

64 ANS: 2

$M_x = \frac{7+(-3)}{2} = 2$. $M_Y = \frac{-1+3}{2} = 1$.

PTS: 2 REF: 011106ge STA: G.G.66 TOP: Midpoint

65 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

66 ANS: 2

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

PTS: 2 REF: 081019ge STA: G.G.66 TOP: Midpoint
KEY: general

67 ANS:

$(6,-4)$. $C_x = \frac{Q_x + R_x}{2}$. $C_y = \frac{Q_y + R_y}{2}$.

$$3.5 = \frac{1+R_x}{2} \qquad 2 = \frac{8+R_y}{2}$$
$$7 = 1 + R_x \qquad 4 = 8 + R_y$$
$$6 = R_x \qquad -4 = R_y$$

PTS: 2 REF: 011031ge STA: G.G.66 TOP: Midpoint
KEY: graph

68 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

69 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

70 ANS: 4

$$-5 = \frac{-3+x}{2}. \quad 2 = \frac{6+y}{2}$$

$$-10=-3+x \qquad 4=6+y$$

$$-7=x \qquad -2=y$$

PTS: 2 REF: 081203ge STA: G.G.66 TOP: Midpoint

71 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

72 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

73 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

74 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

75 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

76 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

77 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

78 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

79 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

80 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

81 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

82 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

83 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

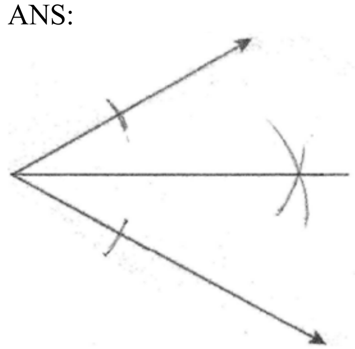
84 ANS: 3 PTS: 2 REF: fall0816ge STA: G.G.1
TOP: Planes

85 ANS: 4 PTS: 2 REF: 011315ge STA: G.G.1
TOP: Planes

86 ANS: 4 PTS: 2 REF: 011012ge STA: G.G.1
TOP: Planes
87 ANS: 3 PTS: 2 REF: 061017ge STA: G.G.1
TOP: Planes
88 ANS: 4 PTS: 2 REF: 061118ge STA: G.G.1
TOP: Planes
89 ANS: 3 PTS: 2 REF: 081218ge STA: G.G.1
TOP: Planes
90 ANS: 1 PTS: 2 REF: 060918ge STA: G.G.2
TOP: Planes
91 ANS: 1 PTS: 2 REF: 011128ge STA: G.G.2
TOP: Planes
92 ANS: 1 PTS: 2 REF: 061310ge STA: G.G.2
TOP: Planes
93 ANS: 1 PTS: 2 REF: 011024ge STA: G.G.3
TOP: Planes
94 ANS: 1 PTS: 2 REF: 081008ge STA: G.G.3
TOP: Planes
95 ANS: 1 PTS: 2 REF: 011218ge STA: G.G.3
TOP: Planes
96 ANS: 2 PTS: 2 REF: 080927ge STA: G.G.4
TOP: Planes
97 ANS: 4 PTS: 2 REF: 081211ge STA: G.G.5
TOP: Planes
98 ANS: 4 PTS: 2 REF: 061213ge STA: G.G.5
TOP: Planes
99 ANS: 4 PTS: 2 REF: 080914ge STA: G.G.7
TOP: Planes
100 ANS: 1 PTS: 2 REF: 081116ge STA: G.G.7
TOP: Planes
101 ANS: 3 PTS: 2 REF: 060928ge STA: G.G.8
TOP: Planes
102 ANS: 2 PTS: 2 REF: 081120ge STA: G.G.8
TOP: Planes
103 ANS: 4 PTS: 2 REF: 061203ge STA: G.G.9
TOP: Planes
104 ANS: 2 PTS: 2 REF: fall0806ge STA: G.G.9
TOP: Planes
105 ANS: 3 PTS: 2 REF: 081002ge STA: G.G.9
TOP: Planes
106 ANS: 2 PTS: 2 REF: 011109ge STA: G.G.9
TOP: Planes
107 ANS: 1 PTS: 2 REF: 061108ge STA: G.G.9
TOP: Planes
108 ANS: 4 PTS: 2 REF: 011306ge STA: G.G.9
TOP: Planes

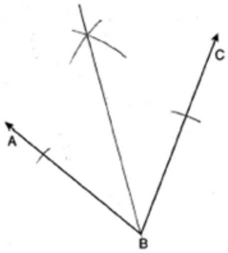
109 ANS: 1 PTS: 2 REF: 081323ge STA: G.G.9
TOP: Planes
110 ANS: 3
The lateral edges of a prism are parallel.

PTS: 2 REF: fall0808ge STA: G.G.10 TOP: Solids
111 ANS: 4 PTS: 2 REF: 061003ge STA: G.G.10
TOP: Solids
112 ANS: 3 PTS: 2 REF: 011105ge STA: G.G.10
TOP: Solids
113 ANS: 1 PTS: 2 REF: 011221ge STA: G.G.10
TOP: Solids
114 ANS: 2 PTS: 2 REF: 081311ge STA: G.G.10
TOP: Solids
115 ANS: 2 PTS: 2 REF: 061315ge STA: G.G.13
TOP: Solids
116 ANS: 4 PTS: 2 REF: 060904ge STA: G.G.13
TOP: Solids
117 ANS: 3 PTS: 2 REF: 060925ge STA: G.G.17
TOP: Constructions
118 ANS: 3 PTS: 2 REF: 080902ge STA: G.G.17
TOP: Constructions
119 ANS: 2 PTS: 2 REF: 011004ge STA: G.G.17
TOP: Constructions
120 ANS: 4 PTS: 2 REF: 081106ge STA: G.G.17
TOP: Constructions
121 ANS: 3 PTS: 2 REF: fall0804ge STA: G.G.18
TOP: Constructions
122 ANS:



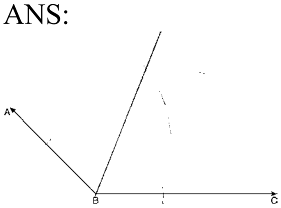
PTS: 2 REF: fall0832ge STA: G.G.17 TOP: Constructions

123 ANS:



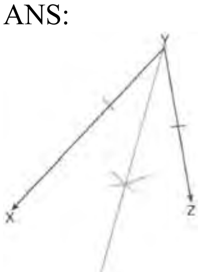
PTS: 2 REF: 080932ge STA: G.G.17 TOP: Constructions

124 ANS:



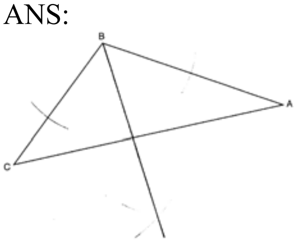
PTS: 2 REF: 011133ge STA: G.G.17 TOP: Constructions

125 ANS:



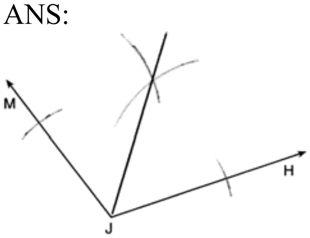
PTS: 2 REF: 011233ge STA: G.G.17 TOP: Constructions

126 ANS:



PTS: 2 REF: 061232ge STA: G.G.17 TOP: Constructions

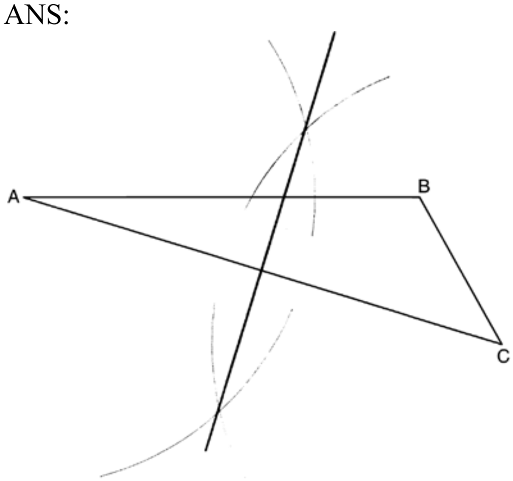
127 ANS:



PTS: 2 REF: 081330ge STA: G.G.17 TOP: Constructions

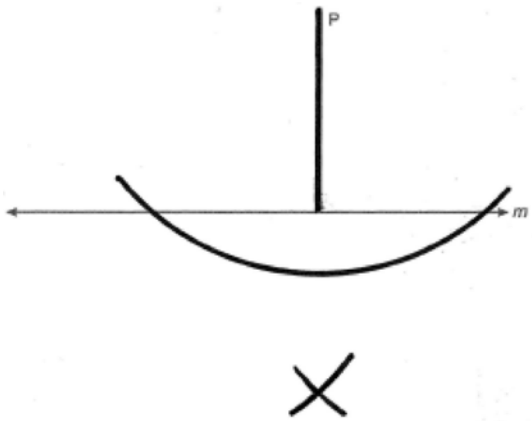
128 ANS: 2 PTS: 2 REF: 081205ge STA: G.G.17
TOP: Constructions

129 ANS: 1 PTS: 2 REF: 011120ge STA: G.G.18
TOP: Constructions
130 ANS: 2 PTS: 2 REF: 061101ge STA: G.G.18
TOP: Constructions
131 ANS: 4 PTS: 2 REF: 081005ge STA: G.G.18
TOP: Constructions
132 ANS: 2 PTS: 2 REF: 061305ge STA: G.G.18
TOP: Constructions
133 ANS: 1 PTS: 2 REF: fall0807ge STA: G.G.19
TOP: Constructions
134 ANS:



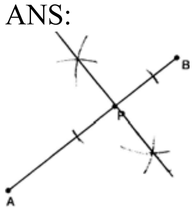
PTS: 2 REF: 081130ge STA: G.G.18 TOP: Constructions
135 ANS: 4 PTS: 2 REF: 011009ge STA: G.G.19
TOP: Constructions
136 ANS: 2 PTS: 2 REF: 061020ge STA: G.G.19
TOP: Constructions
137 ANS: 2 PTS: 2 REF: 061208ge STA: G.G.19
TOP: Constructions
138 ANS: 4 PTS: 2 REF: 081313ge STA: G.G.19
TOP: Constructions

139 ANS:



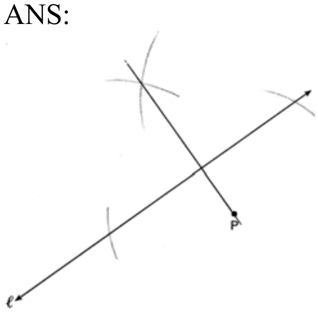
PTS: 2 REF: 060930ge STA: G.G.19 TOP: Constructions

140 ANS:



PTS: 2 REF: 081233ge STA: G.G.19 TOP: Constructions

141 ANS:



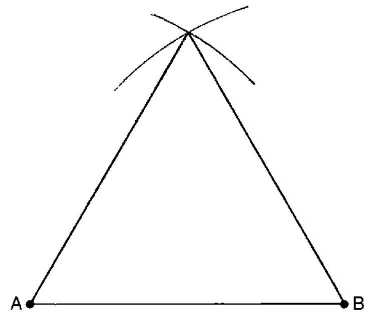
PTS: 2 REF: 011333ge STA: G.G.19 TOP: Constructions

142 ANS: 1 PTS: 2 REF: 061012ge STA: G.G.20
TOP: Constructions

143 ANS: 1 PTS: 2 REF: 011207ge STA: G.G.20
TOP: Constructions

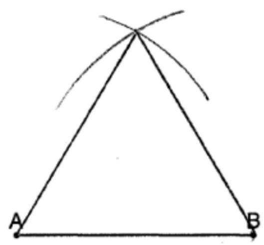
144 ANS: 3 PTS: 2 REF: 011309ge STA: G.G.20
TOP: Constructions

145 ANS:



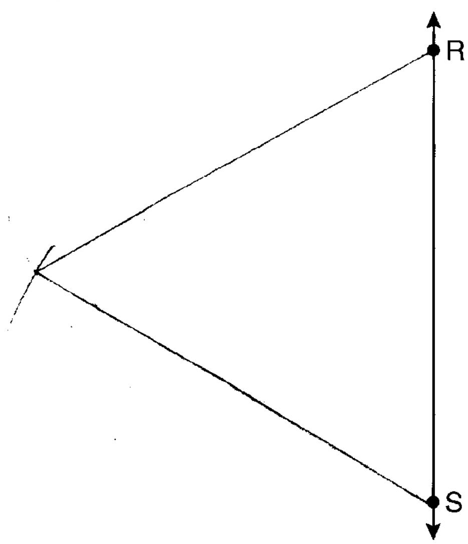
PTS: 2 REF: 081032ge STA: G.G.20 TOP: Constructions

146 ANS:



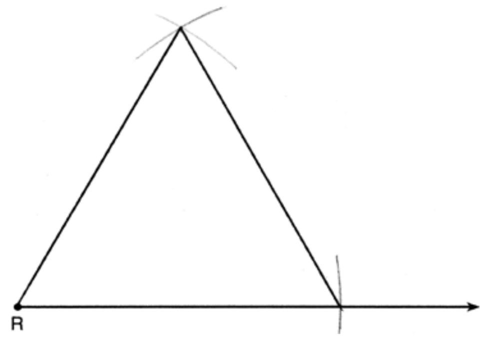
PTS: 2 REF: 011032ge STA: G.G.20 TOP: Constructions

147 ANS:



PTS: 2 REF: 061130ge STA: G.G.20 TOP: Constructions

148 ANS:



PTS: 2 REF: 061332ge STA: G.G.20 TOP: Constructions

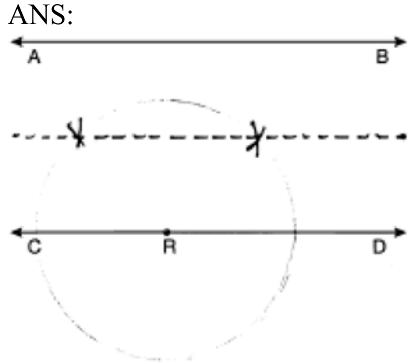
149 ANS: 2 PTS: 2 REF: 061121ge STA: G.G.22
TOP: Locus

150 ANS: 2 PTS: 2 REF: 011317ge STA: G.G.22
TOP: Locus

151 ANS: 2 PTS: 2 REF: 011011ge STA: G.G.22
TOP: Locus

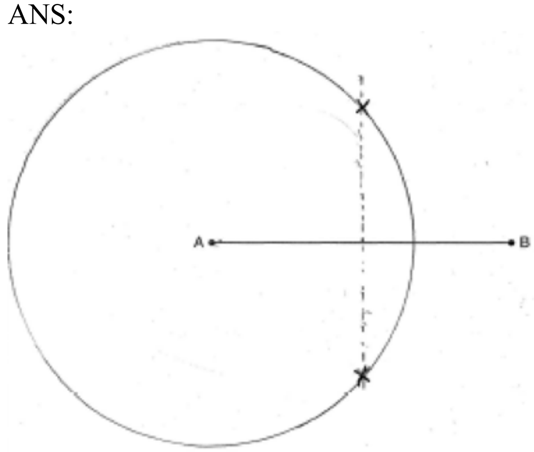
152 ANS: 4 PTS: 2 REF: 061303ge STA: G.G.22
TOP: Locus

153 ANS:



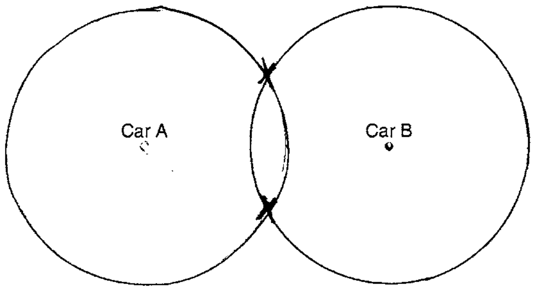
PTS: 2 REF: 061033ge STA: G.G.22 TOP: Locus

154 ANS:



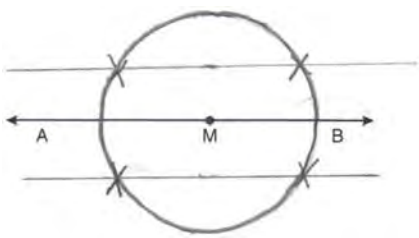
PTS: 2 REF: 060932ge STA: G.G.22 TOP: Locus

155 ANS:



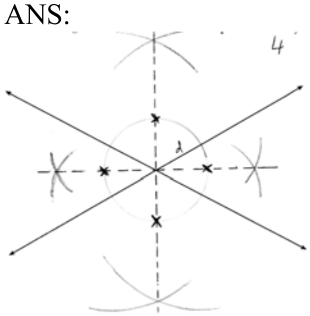
PTS: 2 REF: 081033ge STA: G.G.22 TOP: Locus

156 ANS:



PTS: 2 REF: 011230ge STA: G.G.22 TOP: Locus

157 ANS:



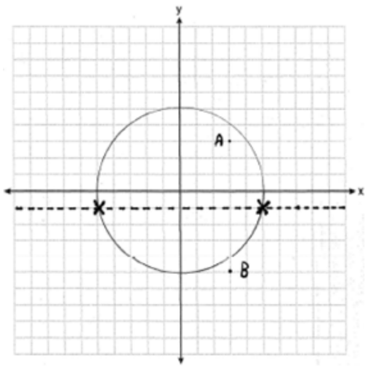
PTS: 2 REF: 081334ge STA: G.G.22 TOP: Locus

158 ANS: 2 PTS: 2 REF: 081316ge STA: G.G.23
TOP: Locus

159 ANS: 4 PTS: 2 REF: 060912ge STA: G.G.23
TOP: Locus

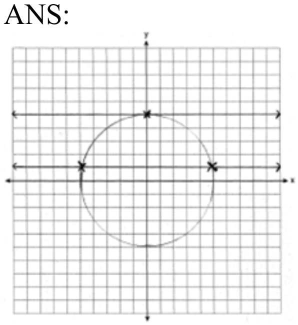
160 ANS: 2 PTS: 2 REF: 081117ge STA: G.G.23
TOP: Locus

161 ANS:



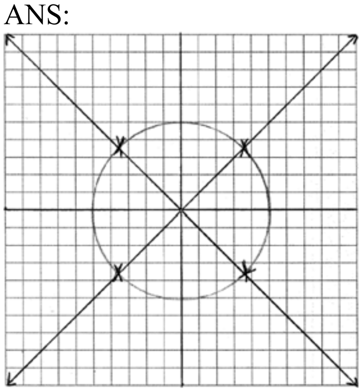
PTS: 4 REF: fall0837ge STA: G.G.23 TOP: Locus

162 ANS:



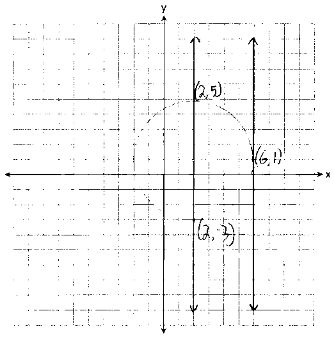
PTS: 4 REF: 080936ge STA: G.G.23 TOP: Locus

163 ANS:



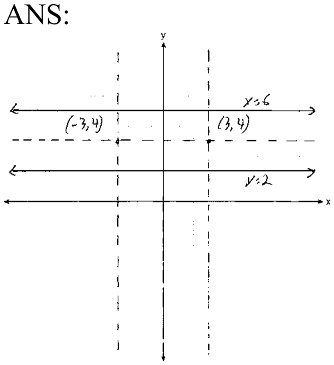
PTS: 4 REF: 011037ge STA: G.G.23 TOP: Locus

164 ANS:



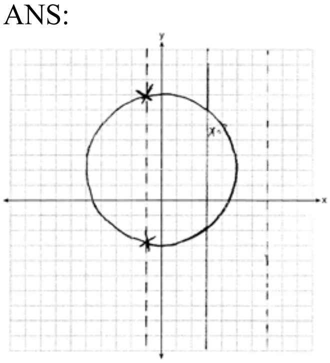
PTS: 4 REF: 011135ge STA: G.G.23 TOP: Locus

165 ANS:



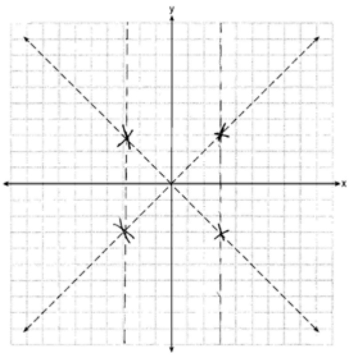
PTS: 4 REF: 061135ge STA: G.G.23 TOP: Locus

166 ANS:



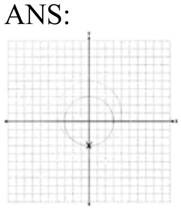
PTS: 2 REF: 061234ge STA: G.G.23 TOP: Locus

167 ANS:



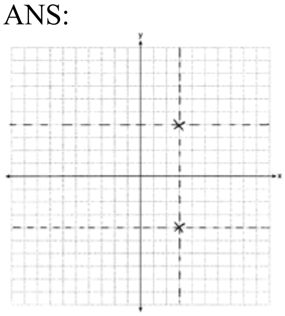
PTS: 2 REF: 081234ge STA: G.G.23 TOP: Locus

168 ANS:



PTS: 2 REF: 011331ge STA: G.G.23 TOP: Locus

169 ANS:



PTS: 2 REF: 061333ge STA: G.G.23 TOP: Locus

170 ANS: 2

$7x = 5x + 30$

$2x = 30$

$x = 15$

PTS: 2 REF: 061106ge STA: G.G.35 TOP: Parallel Lines and Transversals

171 ANS: 3

$7x = 5x + 30$

$2x = 30$

$x = 15$

PTS: 2 REF: 081109ge STA: G.G.35 TOP: Parallel Lines and Transversals

172 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

173 ANS: 3

$$4x + 14 + 8x + 10 = 180$$
$$12x = 156$$
$$x = 13$$

PTS: 2 REF: 081213ge STA: G.G.35 TOP: Parallel Lines and Transversals

174 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

175 ANS: 3 PTS: 2 REF: 061320ge STA: G.G.35
TOP: Parallel Lines and Transversals

176 ANS: 2 PTS: 2 REF: 061007ge STA: G.G.35
TOP: Parallel Lines and Transversals

Geometry Regents Exam Questions by Performance Indicator: Topic
Answer Section

177 ANS:
$180-(90+63)=27$

PTS: 2 REF: 061230ge STA: G.G.35 TOP: Parallel Lines and Transversals

178 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

179 ANS: 3
$8^2+24^2 \ne 25^2$

PTS: 2 REF: 011111ge STA: G.G.48 TOP: Pythagorean Theorem

180 ANS: 2
$2^2+3^2 \ne 4^2$

PTS: 2 REF: 011316ge STA: G.G.48 TOP: Pythagorean Theorem

181 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

182 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

183 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

184 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

185 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

186 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

187 ANS: 1

$3x + 5 + 4x - 15 + 2x + 10 = 180$. $m\angle D = 3(20) + 5 = 65$. $m\angle E = 4(20) - 15 = 65$.

$$9x = 180$$
$$x = 20$$

PTS: 2 REF: 061119ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

188 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

189 ANS: 3

$$\begin{aligned} 3x + 1 + 4x - 17 + 5x - 20 &= 180. \quad 3(18) + 1 = 55 \\ 12x - 36 &= 180 \quad 4(18) - 17 = 55 \\ 12x &= 216 \quad 5(18) - 20 = 70 \\ x &= 18 \end{aligned}$$

PTS: 2 REF: 061308ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

190 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

191 ANS: 4 PTS: 2 REF: 081206ge STA: G.G.30
TOP: Interior and Exterior Angles of Triangles

192 ANS: 1

$$\frac{180-52}{2} = 64. \quad 180 - (90 + 64) = 26$$

PTS: 2 REF: 011314ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

193 ANS:

26. $$\begin{aligned} x + 3x + 5x - 54 &= 180 \\ 9x &= 234 \\ x &= 26 \end{aligned}$$

PTS: 2 REF: 080933ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

194 ANS:

34. $$\begin{aligned} 2x - 12 + x + 90 &= 180 \\ 3x + 78 &= 90 \\ 3x &= 102 \\ x &= 34 \end{aligned}$$

PTS: 2 REF: 061031ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

195 ANS:

$$\begin{aligned} A &= 2B - 15 \\ C &= A + B \\ C &= 2B - 15 + B \end{aligned} \quad . \quad \begin{aligned} 2B - 15 + B + 2B - 15 + B &= 180 \\ 6B - 30 &= 180 \\ 6B &= 210 \\ B &= 35 \end{aligned}$$

PTS: 2 REF: 081332ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

196 ANS: 3 PTS: 2 REF: 011007ge STA: G.G.31
TOP: Isosceles Triangle Theorem

197 ANS: 3 PTS: 2 REF: 061004ge STA: G.G.31
TOP: Isosceles Triangle Theorem

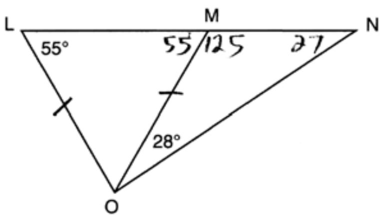
198 ANS: 4 PTS: 2 REF: 061124ge STA: G.G.31
TOP: Isosceles Triangle Theorem

199 ANS: 4

$180 - (40 + 40) = 100$

PTS: 2 REF: 080903ge STA: G.G.31 TOP: Isosceles Triangle Theorem

200 ANS: 1



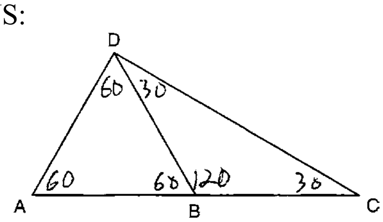
PTS: 2 REF: 061211ge STA: G.G.31 TOP: Isosceles Triangle Theorem

201 ANS: 2

$$3x + x + 20 + x + 20 = 180$$
$$5x = 40$$
$$x = 28$$

PTS: 2 REF: 081222ge STA: G.G.31 TOP: Isosceles Triangle Theorem

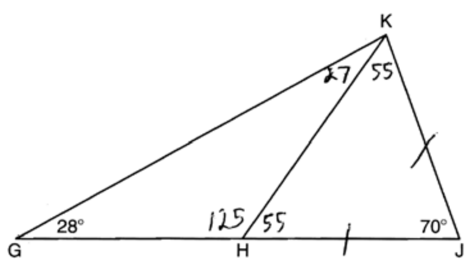
202 ANS:

30. 

PTS: 2 REF: 011129ge STA: G.G.31 TOP: Isosceles Triangle Theorem

203 ANS:

No, $\angle KGH$ is not congruent to $\angle GKH$.

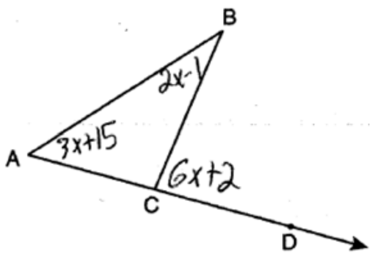


PTS: 2 REF: 081135ge STA: G.G.31 TOP: Isosceles Triangle Theorem

204 ANS:
67. $\frac{180-46}{2}=67$

PTS: 2 REF: 011029ge STA: G.G.31 TOP: Isosceles Triangle Theorem

205 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

206 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

207 ANS: 2 PTS: 2 REF: 061107ge STA: G.G.32
TOP: Exterior Angle Theorem

208 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

209 ANS: 4
$6x=x+40+3x+10$. $m\angle CAB=25+40=65$
$6x=4x+50$
$2x=50$
$x=25$

PTS: 2 REF: 081310ge STA: G.G.32 TOP: Exterior Angle Theorem

210 ANS: 2 PTS: 2 REF: 011206ge STA: G.G.32
TOP: Exterior Angle Theorem

211 ANS: 4
(4) is not true if $\angle PQR$ is obtuse.

PTS: 2 REF: 060924ge STA: G.G.32 TOP: Exterior Angle Theorem

212 ANS: 3 PTS: 2 REF: 081111ge STA: G.G.32
TOP: Exterior Angle Theorem

213 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

214 ANS: 2
$7 + 18 > 6 + 12$

PTS: 2 REF: fall0819ge STA: G.G.33 TOP: Triangle Inequality Theorem

215 ANS: 2
$6 + 17 > 22$

PTS: 2 REF: 080916ge STA: G.G.33 TOP: Triangle Inequality Theorem

216 ANS: 2
$5 - 3 = 2, 5 + 3 = 8$

PTS: 2 REF: 011228ge STA: G.G.33 TOP: Triangle Inequality Theorem

217 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

218 ANS: 1 PTS: 2 REF: 061010ge STA: G.G.34
TOP: Angle Side Relationship

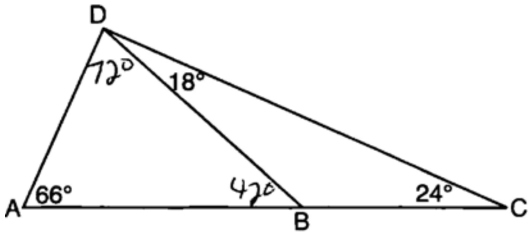
219 ANS: 4
Longest side of a triangle is opposite the largest angle. Shortest side is opposite the smallest angle.

PTS: 2 REF: 081011ge STA: G.G.34 TOP: Angle Side Relationship

220 ANS: 4
$m\angle A = 80$

PTS: 2 REF: 011115ge STA: G.G.34 TOP: Angle Side Relationship

221 ANS: 1



PTS: 2 REF: 081219ge STA: G.G.34 TOP: Angle Side Relationship

222 ANS: 2 PTS: 2 REF: 061321ge STA: G.G.34
TOP: Angle Side Relationship

223 ANS: 4 PTS: 2 REF: 011222ge STA: G.G.34
TOP: Angle Side Relationship

224 ANS: 2 PTS: 2 REF: 081306ge STA: G.G.34
TOP: Angle Side Relationship

225 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

226 ANS:
$x^2 + 12 + 11x + 5 + 13x - 17 = 180$. $m\angle A = 6^2 + 12 = 48$. $\angle B$ is the largest angle, so $\overline{AC}$ in the longest side.

$$x^2 + 24x - 180 = 0 \qquad m\angle B = 11(6) + 5 = 71$$
$$(x + 30)(x - 6) = 0 \qquad m\angle C = 13(6) - 7 = 61$$
$$x = 6$$

PTS: 4 REF: 011337ge STA: G.G.34 TOP: Angle Side Relationship

227 ANS: 2

$$\frac{3}{7} = \frac{6}{x}$$
$$3x = 42$$
$$x = 14$$

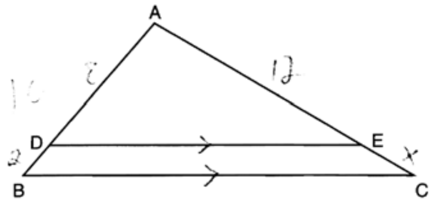
PTS: 2 REF: 081027ge STA: G.G.46 TOP: Side Splitter Theorem

228 ANS: 3

$$\frac{5}{7} = \frac{10}{x}$$
$$5x = 70$$
$$x = 14$$

PTS: 2 REF: 081103ge STA: G.G.46 TOP: Side Splitter Theorem

229 ANS: 3



$\frac{8}{2} = \frac{12}{x}$.

$8x = 24$

$x = 3$

PTS: 2 REF: 061216ge STA: G.G.46 TOP: Side Splitter Theorem

230 ANS: 4

$\Delta ABC \sim \Delta DBE$. $\frac{\overline{AB}}{\overline{DB}} = \frac{\overline{AC}}{\overline{DE}}$

$\frac{9}{2} = \frac{x}{3}$

$x = 13.5$

PTS: 2 REF: 060927ge STA: G.G.46 TOP: Side Splitter Theorem

231 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

232 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

233 ANS:

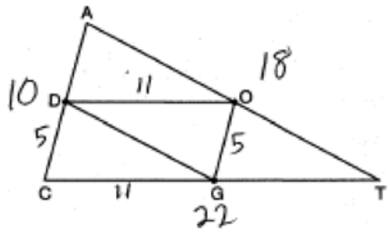
5. $\frac{3}{x} = \frac{6+3}{15}$

$9x = 45$

$x = 5$

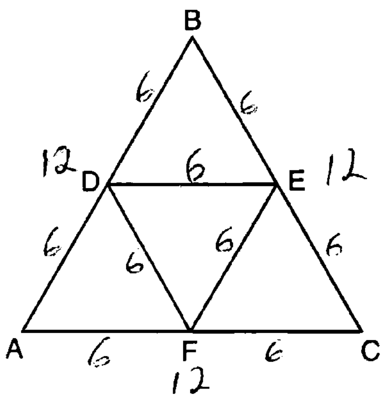
PTS: 2 REF: 011033ge STA: G.G.46 TOP: Side Splitter Theorem

234 ANS: 3



PTS: 2 REF: 080920ge STA: G.G.42 TOP: Midsegments

235 ANS: 1



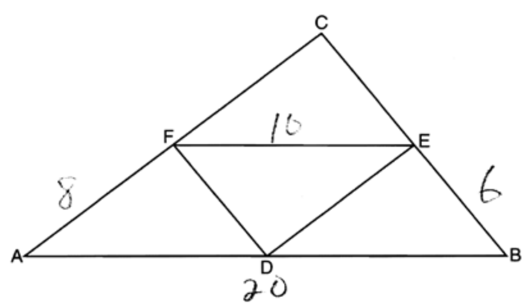
PTS: 2 REF: 081003ge STA: G.G.42 TOP: Midsegments

236 ANS: 2

$$\frac{4x+10}{2}=2x+5$$

PTS: 2 REF: 011103ge STA: G.G.42 TOP: Midsegments

237 ANS: 4



$20+8+10+6=44.$

PTS: 2 REF: 061211ge STA: G.G.42 TOP: Midsegments

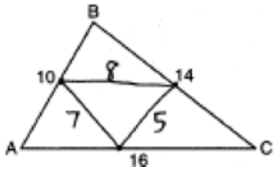
238 ANS: 3

$$3x-15=2(6)$$
$$3x=27$$
$$x=9$$

PTS: 2 REF: 061311ge STA: G.G.42 TOP: Midsegments

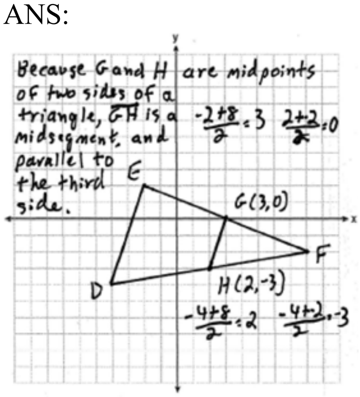
239 ANS: 3 PTS: 2 REF: 081320ge STA: G.G.42
TOP: Midsegments
240 ANS: 3 PTS: 2 REF: 081227ge STA: G.G.42
TOP: Midsegments
241 ANS: 3 PTS: 2 REF: 011311ge STA: G.G.42
TOP: Midsegments
242 ANS:
20. The sides of the triangle formed by connecting the midpoints are half the sides of the original triangle.

$5 + 7 + 8 = 20$.



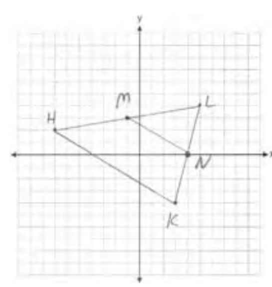
PTS: 2 REF: 060929ge STA: G.G.42 TOP: Midsegments
243 ANS:
37. Since $\overline{DE}$ is a midsegment, $AC = 14$. $10 + 13 + 14 = 37$

PTS: 2 REF: 061030ge STA: G.G.42 TOP: Midsegments
244 ANS:



PTS: 4 REF: fall0835ge STA: G.G.42 TOP: Midsegments
245 ANS:

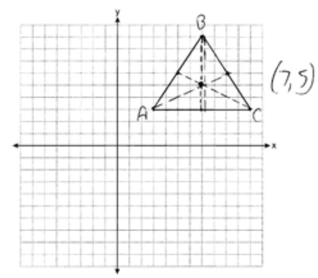
$M\left(\dfrac{-7+5}{2}, \dfrac{2+4}{2}\right) = M(-1,3)$. $N\left(\dfrac{3+5}{2}, \dfrac{-4+4}{2}\right) = N(4,0)$. $\overline{MN}$ is a midsegment.



PTS: 4 REF: 011237ge STA: G.G.42 TOP: Midsegments
246 ANS: 1 PTS: 2 REF: 061214ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter
247 ANS: 3 PTS: 2 REF: 011110ge STA: G.G.21
KEY: Centroid, Orthocenter, Incenter and Circumcenter

248 ANS: 3 PTS: 2 REF: 011202ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter
249 ANS: 3 PTS: 2 REF: fall0825ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter
250 ANS: 4 PTS: 2 REF: 081224ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter
251 ANS: 4 PTS: 2 REF: 080925ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter
252 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
253 ANS: 1 PTS: 2 REF: 081028ge STA: G.G.21
TOP: Centroid, Orthocenter, Incenter and Circumcenter
254 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
255 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
256 ANS: 1
The centroid divides each median into segments whose lengths are in the ratio 2 : 1.

$$\begin{aligned} \overline{GC} &= 2\overline{FG} \\ \overline{GC} + \overline{FG} &= 24 \\ 2\overline{FG} + \overline{FG} &= 24 \\ 3\overline{FG} &= 24 \\ \overline{FG} &= 8 \end{aligned}$$

PTS: 2 REF: 081018ge STA: G.G.43 TOP: Centroid
257 ANS: 1 PTS: 2 REF: 061104ge STA: G.G.43
TOP: Centroid

258 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

259 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

260 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

261 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

262 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

263 ANS: 2 PTS: 2 REF: 061115ge STA: G.G.69
TOP: Triangles in the Coordinate Plane

264 ANS: 2 PTS: 2 REF: 081226ge STA: G.G.69
TOP: Triangles in the Coordinate Plane

265 ANS: 3

$AB = 8 - 4 = 4$. $BC = \sqrt{(-2-(-5))^2 + (8-6)^2} = \sqrt{13}$. $AC = \sqrt{(-2-(-5))^2 + (4-6)^2} = \sqrt{13}$

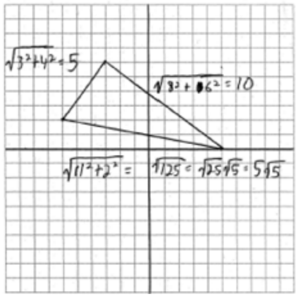
PTS: 2 REF: 011328ge STA: G.G.69 TOP: Triangles in the Coordinate Plane

266 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

267 ANS:

$15+5\sqrt{5}$. 

PTS: 4 REF: 060936ge STA: G.G.69 TOP: Triangles in the Coordinate Plane

268 ANS: 3 PTS: 2 REF: 061218ge STA: G.G.36
TOP: Interior and Exterior Angles of Polygons

269 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

270 ANS: 4

sum of interior ∠s = sum of exterior ∠s

$$(n-2)180=n\left(180-\frac{(n-2)180}{n}\right)$$

$$180n-360=180n-180n+360$$

$$180n=720$$

$$n=4$$

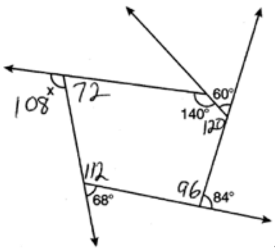
PTS: 2 REF: 081016ge STA: G.G.36 TOP: Interior and Exterior Angles of Polygons

271 ANS: 3

$(n-2)180=(5-2)180=540$

PTS: 2 REF: 011223ge STA: G.G.36 TOP: Interior and Exterior Angles of Polygons

272 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

273 ANS: 1

$\angle A = \dfrac{(n-2)180}{n} = \dfrac{(5-2)180}{5} = 108 \quad \angle AEB = \dfrac{180-108}{2} = 36$

PTS: 2 REF: 081022ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

274 ANS: 4

$(n-2)180 = (8-2)180 = 1080.\ \dfrac{1080}{8} = 135.$

PTS: 2 REF: fall0827ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

275 ANS: 2

$(n-2)180 = (6-2)180 = 720.\ \dfrac{720}{6} = 120.$

PTS: 2 REF: 081125ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

276 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

277 ANS: 4

$(n-2)180 - n\left(\dfrac{(n-2)180}{n}\right) = 180n - 360 - 180n + 180n - 360 = 180n - 720.$

$180(5) - 720 = 180$

PTS: 2 REF: 081322ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

278 ANS:

$(5-2)180 = 540.\ \dfrac{540}{5} = 108$ interior. $180 - 108 = 72$ exterior

PTS: 2 REF: 011131ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

279 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

280 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

281 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

282 ANS: 3 PTS: 2 REF: 011104ge STA: G.G.38
TOP: Parallelograms

283 ANS: 3 PTS: 2 REF: 061111ge STA: G.G.38
TOP: Parallelograms

284 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

285 ANS: 1 PTS: 2 REF: 011112ge STA: G.G.39
TOP: Special Parallelograms

286 ANS: 2
The diagonals of a rhombus are perpendicular. $180-(90+12)=78$

PTS: 2 REF: 011204ge STA: G.G.39 TOP: Special Parallelograms

287 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

288 ANS: 3
$\sqrt{5^2+12^2}=13$

PTS: 2 REF: 061116ge STA: G.G.39 TOP: Special Parallelograms

289 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.39 TOP: Special Parallelograms

290 ANS: 2

$\sqrt{8^2+15^2} = 17$

PTS: 2 REF: 061326ge STA: G.G.39 TOP: Special Parallelograms

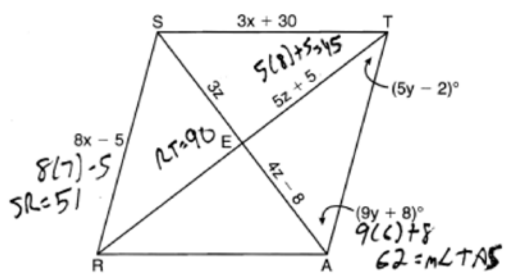
291 ANS: 3 PTS: 2 REF: 061228ge STA: G.G.39
TOP: Special Parallelograms

292 ANS: 1 PTS: 2 REF: 061125ge STA: G.G.39
TOP: Special Parallelograms

293 ANS: 1 PTS: 2 REF: 081121ge STA: G.G.39
TOP: Special Parallelograms

294 ANS: 3 PTS: 2 REF: 081128ge STA: G.G.39
TOP: Special Parallelograms

295 ANS:



$8x-5=3x+30$. $4z-8=3z$. $9y+8+5y-2=90$.

$5x = 35$ $\quad z = 8$ $\quad 14y+6=90$

$x = 7$ $\quad 14y = 84$

$y = 6$

PTS: 6 REF: 061038ge STA: G.G.39 TOP: Special Parallelograms

296 ANS: 2

The length of the midsegment of a trapezoid is the average of the lengths of its bases. $\frac{x+30}{2} = 44$.

$x+30 = 88$

$x = 58$

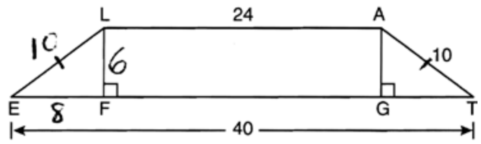
PTS: 2 REF: 011001ge STA: G.G.40 TOP: Trapezoids

297 ANS: 4

$\sqrt{25^2-\left(\frac{26-12}{2}\right)^2} = 24$

PTS: 2 REF: 011219ge STA: G.G.40 TOP: Trapezoids

298 ANS: 1



$\frac{40-24}{2}=8$. $\sqrt{10^2-8^2}=6$.

PTS: 2 REF: 061204ge STA: G.G.40 TOP: Trapezoids

299 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

300 ANS: 3

$2(4x+20)+2(3x-15)=360$. $\angle D=3(25)-15=60$

$$8x+40+6x-30=360$$
$$14x+10=360$$
$$14x=350$$
$$x=25$$

PTS: 2 REF: 011321ge STA: G.G.40 TOP: Trapezoids

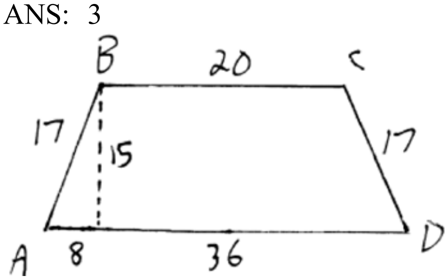
301 ANS: 3

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

302 ANS: 3



$\frac{36-20}{2}=8$. $\sqrt{17^2-8^2}=15$

PTS: 2 REF: 061016ge STA: G.G.40 TOP: Trapezoids

303 ANS: 4 PTS: 2 REF: 061008ge STA: G.G.40

TOP: Trapezoids

304 ANS: 2
Isosceles or not, ΔRSV and ΔRST 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

305 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

306 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

307 ANS:
$12x-4+180-6x+6x+7x+13=360.$ $16y+1=\dfrac{12y+1+18y+6}{2}$
$19x+189=360$ $32y+2=30y+7$
$19x=171$ $2y=5$
$x=9$ $y=\dfrac{5}{2}$

PTS: 4 REF: 081337ge STA: G.G.40 TOP: Trapezoids

308 ANS: 1 PTS: 2 REF: 080918ge STA: G.G.41
TOP: Special Quadrilaterals

309 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

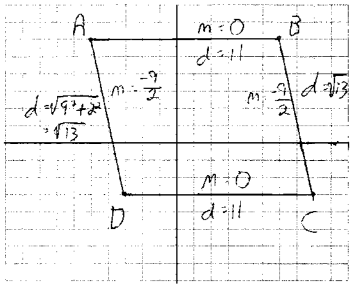
310 ANS: 1
The diagonals of a parallelogram intersect at their midpoints. $M_{\overline{AC}}\left(\dfrac{1+3}{2},\dfrac{5+(-1)}{2}\right)=(2,2)$

PTS: 2 REF: 061209ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

311 ANS:
$m_{\overline{AB}}=\dfrac{4-1}{4-2}=\dfrac{3}{2}.$ $m_{\overline{BC}}=-\dfrac{2}{3}$

PTS: 4 REF: 061334ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

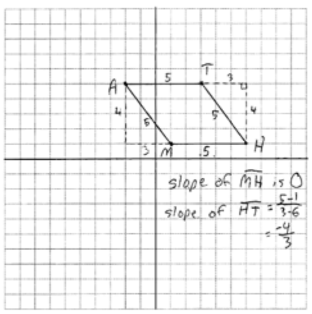
312 ANS:



$\overline{AB} \parallel \overline{CD}$ 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

313 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

314 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

315 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

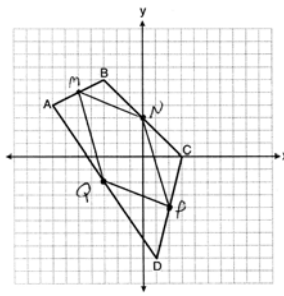
$N\left(\frac{-3+3}{2},\frac{6+0}{2}\right)=N(0,3)$ $m_{\overline{PQ}}=\frac{-4--2}{2--3}=\frac{-2}{5}$

$P\left(\frac{3+1}{2},\frac{0+-8}{2}\right)=P(2,-4)$ $m_{\overline{NA}}=\frac{3--4}{0-2}=\frac{7}{-2}$

$Q\left(\frac{-7+1}{2},\frac{4+-8}{2}\right)=Q(-3,-2)$ $m_{\overline{QM}}=\frac{-2-5}{-3--5}=\frac{-7}{2}$

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.

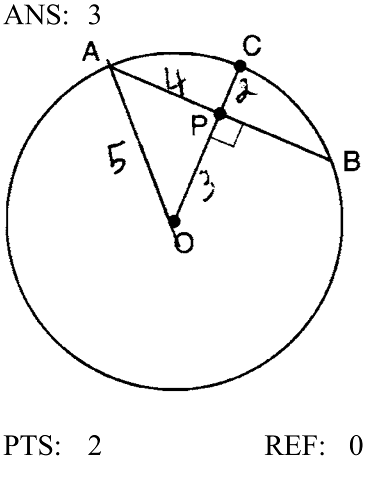
PTS: 6 REF: 081338ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

316 ANS: 4 PTS: 2 REF: 081308ge STA: G.G.49
TOP: Chords

317 ANS: 3
Because $\overline{OC}$ is a radius, its length is 5. Since $CE = 2$ $OE = 3$. ΔEDO is a 3-4-5 triangle. If $ED = 4$, $BD = 8$.

PTS: 2 REF: fall0811ge STA: G.G.49 TOP: Chords

318 ANS: 3



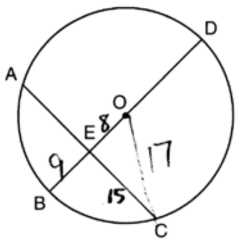
PTS: 2 REF: 011112ge STA: G.G.49 TOP: Chords

319 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

320 ANS: 2



$\sqrt{17^2 - 15^2} = 8.$ $17 - 8 = 9$

PTS: 2 REF: 061221ge STA: G.G.49 TOP: Chords

321 ANS: 3 PTS: 2 REF: 011322ge STA: G.G.49
TOP: Chords

322 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

323 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

324 ANS:

$EO = 6$. $CE = \sqrt{10^2 - 6^2} = 8$

PTS: 2 REF: 011234ge STA: G.G.49 TOP: Chords

325 ANS: 2

Parallel chords intercept congruent arcs. $m\overset{\frown}{AD} = m\overset{\frown}{BC} = 60$. $m\angle CDB = \frac{1}{2} m\overset{\frown}{BC} = 30$.

PTS: 2 REF: 060906ge STA: G.G.52 TOP: Chords

326 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

327 ANS: 3

$\frac{180 - 70}{2} = 55$

PTS: 2 REF: 061205ge STA: G.G.52 TOP: Chords

328 ANS: 2

Parallel chords intercept congruent arcs. $\frac{360-(104+168)}{2}=44$

PTS: 2 REF: 011302ge STA: G.G.52 TOP: Chords

329 ANS: 1

Parallel chords intercept congruent arcs. $m\overset{\frown}{AC}=m\overset{\frown}{BD}$. $\frac{180-110}{2}=35$.

PTS: 2 REF: 081302ge STA: G.G.52 TOP: Chords

330 ANS: 1

Parallel lines intercept congruent arcs.

PTS: 2 REF: 061001ge STA: G.G.52 TOP: Chords

331 ANS: 1

Parallel lines intercept congruent arcs.

PTS: 2 REF: 061105ge STA: G.G.52 TOP: Chords

332 ANS: 4

Parallel lines intercept congruent arcs.

PTS: 2 REF: 081201ge STA: G.G.52 TOP: Chords

333 ANS:

$\frac{180-80}{2}=50$

PTS: 2 REF: 081129ge STA: G.G.52 TOP: Chords

334 ANS:

$2x-20=x+20$. $m\overset{\frown}{AB}=x+20=40+20=60$

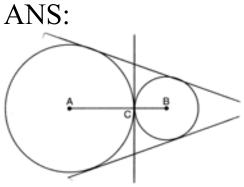
$x=40$

PTS: 2 REF: 011229ge STA: G.G.52 TOP: Chords

335 ANS: 4 PTS: 2 REF: fall0824ge STA: G.G.50
TOP: Tangents KEY: common tangency

336 ANS: 3 PTS: 2 REF: 080928ge STA: G.G.50
TOP: Tangents KEY: common tangency

337 ANS:



PTS: 2 REF: 011330ge STA: G.G.50 TOP: Tangents
KEY: common tangency

338 ANS: 2 PTS: 2 REF: 081214ge STA: G.G.50
TOP: Tangents KEY: point of tangency

339 ANS: 1 PTS: 2 REF: 061013ge STA: G.G.50
TOP: Tangents KEY: point of tangency

340 ANS: 4

$\sqrt{25^2 - 7^2} = 24$

PTS: 2 REF: 081105ge STA: G.G.50 TOP: Tangents
KEY: point of tangency

341 ANS: 2

$\sqrt{15^2 - 12^2} = 9$

PTS: 2 REF: 081325ge STA: G.G.50 TOP: Tangents
KEY: point of tangency

342 ANS: 1 PTS: 2 REF: 081012ge STA: G.G.50
TOP: Tangents KEY: two tangents

343 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

344 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

345 ANS: 3

$\frac{36 + 20}{2} = 28$

PTS: 2 REF: 061019ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: inside circle

346 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

347 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

348 ANS: 1

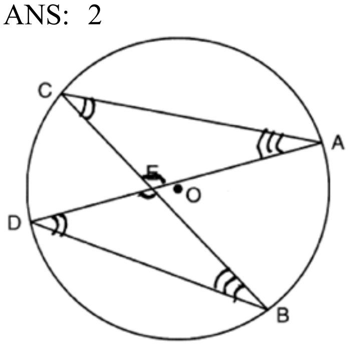
$$\frac{70-20}{2}=25$$

PTS: 2 REF: 011325ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: outside circle

349 ANS: 2 PTS: 2 REF: 061322ge STA: G.G.51
TOP: Arcs Determined by Angles KEY: inscribed

350 ANS: 4 PTS: 2 REF: 011124ge STA: G.G.51
TOP: Arcs Determined by Angles KEY: inscribed

351 ANS: 2



PTS: 2 REF: 061026GE STA: G.G.51 TOP: Arcs Determined by Angles
KEY: inscribed

352 ANS:

$\angle D$, $\angle G$ and 24° or $\angle E$, $\angle F$ and 84°. $m\overset{\frown}{FE}=\frac{2}{15}\times 360=48$. Since the chords forming $\angle D$ and $\angle G$ are intercepted by $\overset{\frown}{FE}$, their measure is 24°. $m\overset{\frown}{GD}=\frac{7}{15}\times 360=168$. 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

353 ANS:

30. $3x+4x+5x=360$. $m\overset{\frown}{LN}:m\overset{\frown}{NK}:m\overset{\frown}{KL}=90:120:150$. $\frac{150-90}{2}=30$
$x=20$

PTS: 4 REF: 061136ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: outside circle

354 ANS:

52, 40, 80. $360-(56+112)=192$. $\frac{192-112}{2}=40$. $\frac{112+48}{2}=80$

$$\frac{1}{4}\times 192=48$$

$$\frac{56+48}{2}=52$$

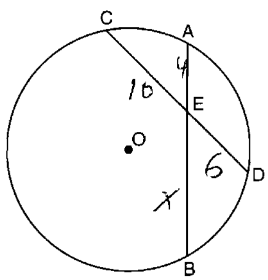
PTS: 6 REF: 081238ge STA: G.G.51 TOP: Arcs Determined by Angles
KEY: mixed

355 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

356 ANS: 1



$$4x=6\cdot 10$$
$$x=15$$

PTS: 2 REF: 081017ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two chords

357 ANS: 1

$$8\times 12=16x$$
$$6=x$$

PTS: 2 REF: 081328ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two chords

358 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

359 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

360 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

361 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

362 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

363 ANS: 4

$$4(x+4)=8^2$$
$$4x+16=64$$
$$4x=48$$
$$x=12$$

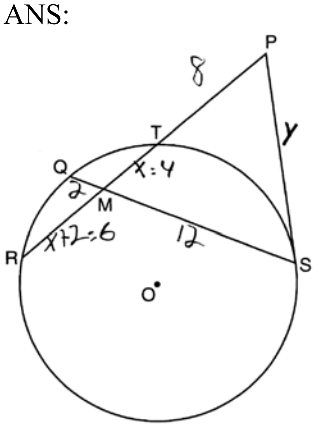
PTS: 2 REF: 061117ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: tangent and secant

364 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

365 ANS:

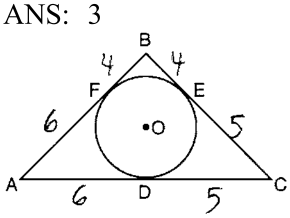


$x(x+2)=12\cdot 2$. $\overline{RT}=6+4=10$. $y\cdot y=18\cdot 8$

$$x^2+2x-24=0 \qquad y^2=144$$
$$(x+6)(x-4)=0 \qquad y=12$$
$$x=4$$

PTS: 4 REF: 061237ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: tangent and secant

366 ANS: 3



PTS: 2 REF: 011101ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two tangents

367 ANS: 4 PTS: 2 REF: 011208ge STA: G.G.53
TOP: Segments Intercepted by Circle KEY: two tangents

368 ANS: 2 PTS: 2 REF: 060910ge STA: G.G.71
TOP: Equations of Circles

369 ANS: 3 PTS: 2 REF: 011010ge STA: G.G.71
TOP: Equations of Circles

370 ANS: 3 PTS: 2 REF: 011116ge STA: G.G.71
TOP: Equations of Circles

371 ANS: 4 PTS: 2 REF: 081110ge STA: G.G.71
TOP: Equations of Circles

372 ANS: 4 PTS: 2 REF: 011212ge STA: G.G.71
TOP: Equations of Circles

373 ANS: 3 PTS: 2 REF: 081209ge STA: G.G.71
TOP: Equations of Circles

374 ANS: 4 PTS: 2 REF: 081305ge STA: G.G.71
TOP: Equations of Circles

375 ANS: 3 PTS: 2 REF: 061210ge STA: G.G.71
TOP: Equations of Circles

376 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

377 ANS: 3 PTS: 2 REF: 061306ge STA: G.G.71
TOP: Equations of Circles

378 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

379 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

380 ANS: 1 PTS: 2 REF: 011220ge STA: G.G.72
TOP: Equations of Circles

381 ANS: 2 PTS: 2 REF: 080921ge STA: G.G.72
TOP: Equations of Circles

382 ANS: 4

The radius is 4. $r^2 = 16$.

PTS: 2 REF: 061014ge STA: G.G.72 TOP: Equations of Circles

383 ANS: 1 PTS: 2 REF: 061110ge STA: G.G.72
TOP: Equations of Circles
384 ANS: 4 PTS: 2 REF: 011323ge STA: G.G.72
TOP: Equations of Circles
385 ANS: 2 PTS: 2 REF: 081212ge STA: G.G.72
TOP: Equations of Circles
386 ANS: 3 PTS: 2 REF: 061309ge STA: G.G.72
TOP: Equations of Circles
387 ANS: 3 PTS: 2 REF: 081312ge STA: G.G.72
TOP: Equations of Circles
388 ANS:
$(x+1)^2+(y-2)^2=36$

PTS: 2 REF: 081034ge STA: G.G.72 TOP: Equations of Circles
389 ANS:
$(x-5)^2+(y+4)^2=36$

PTS: 2 REF: 081132ge STA: G.G.72 TOP: Equations of Circles
390 ANS: 3 PTS: 2 REF: fall0814ge STA: G.G.73
TOP: Equations of Circles
391 ANS: 4 PTS: 2 REF: 060922ge STA: G.G.73
TOP: Equations of Circles
392 ANS: 1 PTS: 2 REF: 080911ge STA: G.G.73
TOP: Equations of Circles
393 ANS: 1 PTS: 2 REF: 081009ge STA: G.G.73
TOP: Equations of Circles
394 ANS: 4 PTS: 2 REF: 061114ge STA: G.G.73
TOP: Equations of Circles
395 ANS: 2 PTS: 2 REF: 011203ge STA: G.G.73
TOP: Equations of Circles
396 ANS: 1 PTS: 2 REF: 061223ge STA: G.G.73
TOP: Equations of Circles
397 ANS: 4 PTS: 2 REF: 011318ge STA: G.G.73
TOP: Equations of Circles
398 ANS: 4 PTS: 2 REF: 061319ge STA: G.G.73
TOP: Equations of Circles
399 ANS:
center: $(3,-4)$; radius: $\sqrt{10}$

PTS: 2 REF: 081333ge STA: G.G.73 TOP: Equations of Circles
400 ANS: 1 PTS: 2 REF: 060920ge STA: G.G.74
TOP: Graphing Circles
401 ANS: 2 PTS: 2 REF: 011020ge STA: G.G.74
TOP: Graphing Circles
402 ANS: 2 PTS: 2 REF: 011125ge STA: G.G.74
TOP: Graphing Circles

403 ANS: 3 PTS: 2 REF: 061220ge STA: G.G.74
TOP: Graphing Circles
404 ANS: 1 PTS: 2 REF: 061325ge STA: G.G.74
TOP: Graphing Circles
405 ANS: 1 PTS: 2 REF: 081324ge STA: G.G.74
TOP: Graphing Circles

Geometry Regents Exam Questions by Performance Indicator: Topic
Answer Section

406 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

407 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

408 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

409 ANS: 3 PTS: 2 REF: 081123ge STA: G.G.12 TOP: Volume

410 ANS: 2 PTS: 2 REF: 011215ge STA: G.G.12 TOP: Volume

411 ANS: 1

$$3x^2 + 18x + 24$$
$$3(x^2 + 6x + 8)$$
$$3(x + 4)(x + 2)$$

PTS: 2 REF: fall0815ge STA: G.G.12 TOP: Volume

412 ANS:

9.1. $(11)(8)h = 800$

$$h \approx 9.1$$

PTS: 2 REF: 061131ge STA: G.G.12 TOP: Volume

413 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

414 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

415 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

416 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

417 ANS:

$V = \pi r^2 h = \pi(5)^2 \cdot 7 = 175\pi$

PTS: 2 REF: 081231ge STA: G.G.14 TOP: Volume

418 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

419 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

420 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

421 ANS:
$L = 2\pi rh = 2\pi \cdot 3 \cdot 7 = 42\pi$

PTS: 2 REF: 061329ge STA: G.G.14 TOP: Volume

422 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: Lateral Area

423 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

424 ANS:
$$\begin{aligned} V &= \pi r^2 h \\ 600\pi &= \pi r^2 \cdot 12 \\ 50 &= r^2 \\ \sqrt{25}\sqrt{2} &= r \\ 5\sqrt{2} &= r \end{aligned}$$
. $L = 2\pi rh = 2\pi \cdot 5\sqrt{2} \cdot 12 \approx 533.1$

PTS: 4 REF: 011236ge STA: G.G.14 TOP: Volume

425 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

426 ANS:
375π $L = \pi r l = \pi(15)(25) = 375\pi$

PTS: 2 REF: 081030ge STA: G.G.15 TOP: Lateral Area

427 ANS: 3
$$\begin{aligned} 120\pi &= \pi(12)(l) \\ 10 &= l \end{aligned}$$

PTS: 2 REF: 081314ge STA: G.G.15 TOP: Volume and Lateral Area

428 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

429 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

430 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

431 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

432 ANS:

$V = \frac{4}{3}\pi \cdot 9^3 = 972\pi$

PTS: 2 REF: 081131ge STA: G.G.16 TOP: Surface Area

433 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: Surface Area

434 ANS: 4

$\text{SA} = 4\pi r^2$ $V = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi \cdot 6^3 = 288\pi$

$144\pi = 4\pi r^2$

$36 = r^2$

$6 = r$

PTS: 2 REF: 081020ge STA: G.G.16 TOP: Surface Area

435 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

436 ANS: 4
$180 - (50 + 30) = 100$

PTS: 2 REF: 081006ge STA: G.G.45 TOP: Similarity
KEY: basic

437 ANS: 2
Perimeter of ΔDEF 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

438 ANS: 4
Corresponding angles of similar triangles are congruent.

PTS: 2 REF: fall0826ge STA: G.G.45 TOP: Similarity
KEY: perimeter and area

439 ANS: 3
$\frac{15}{18} = \frac{5}{6}$

PTS: 2 REF: 081317ge STA: G.G.45 TOP: Similarity
KEY: perimeter and area

440 ANS: 2
Because the triangles are similar, $\frac{m\angle A}{m\angle D} = 1$

PTS: 2 REF: 011022ge STA: G.G.45 TOP: Similarity
KEY: perimeter and area

441 ANS: 4 PTS: 2 REF: 081023ge STA: G.G.45
TOP: Similarity KEY: perimeter and area

442 ANS: 3 PTS: 2 REF: 061224ge STA: G.G.45
TOP: Similarity KEY: basic

443 ANS: 4 PTS: 2 REF: 081216ge STA: G.G.45
TOP: Similarity KEY: basic

444 ANS:
20. $5x + 10 = 4x + 30$

$$x = 20$$

PTS: 2 REF: 060934ge STA: G.G.45 TOP: Similarity
KEY: basic

445 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

446 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

447 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

448 ANS: 1

$$x^2 = 3 \times 12$$
$$x = 6$$

PTS: 2 REF: 011308ge STA: G.G.47 TOP: Similarity
KEY: altitude

449 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: altitude

450 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

451 ANS:
2.4. $5a = 4^2$ $5b = 3^2$ $h^2 = ab$
$a = 3.2$ $b = 1.8$ $h^2 = 3.2 \cdot 1.8$
$h = \sqrt{5.76} = 2.4$

PTS: 4 REF: 081037ge STA: G.G.47 TOP: Similarity
KEY: altitude

452 ANS: 1
$\overline{AB} = 10$ since ΔABC is a 6-8-10 triangle. $6^2 = 10x$
$3.6 = x$

PTS: 2 REF: 060915ge STA: G.G.47 TOP: Similarity
KEY: leg

453 ANS: 4
Let $\overline{AD} = x$. $36x = 12^2$
$x = 4$

PTS: 2 REF: 080922ge STA: G.G.47 TOP: Similarity
KEY: leg

454 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

455 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: leg

456 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

457 ANS: 4

$(x,y) \to (-x,-y)$

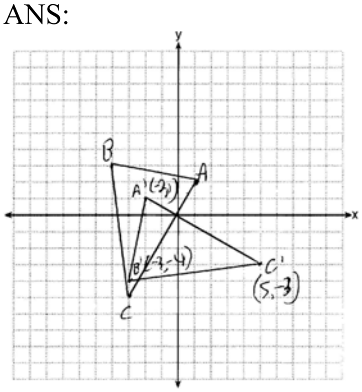
PTS: 2 REF: 061304ge STA: G.G.54 TOP: Rotations

458 ANS:

$R'(-3,-2)$, $S'(-4,4)$, and $T'(2,2)$.

PTS: 2 REF: 011232ge STA: G.G.54 TOP: Rotations

459 ANS:



$A'(-2,1)$, $B'(-3,-4)$, and $C'(5,-3)$

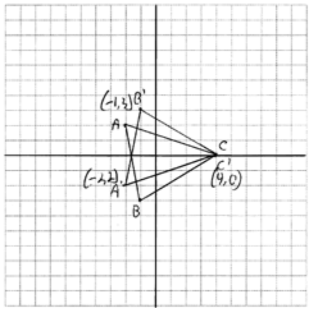
PTS: 2 REF: 081230ge STA: G.G.54 TOP: Rotations

460 ANS: 3 PTS: 2 REF: 060905ge STA: G.G.54
TOP: Reflections KEY: basic

461 ANS: 2 PTS: 2 REF: 081108ge STA: G.G.54
TOP: Reflections KEY: basic

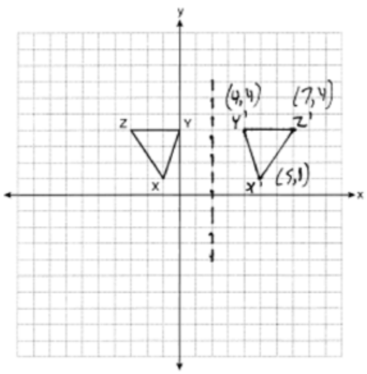
462 ANS: 1 PTS: 2 REF: 081113ge STA: G.G.54
TOP: Reflections KEY: basic

463 ANS:



PTS: 2 REF: 011130ge STA: G.G.54 TOP: Reflections
KEY: grids

464 ANS:



PTS: 2 REF: 061032ge STA: G.G.54 TOP: Reflections
KEY: grids

465 ANS: 3

$-5 + 3 = -2 \qquad 2 + -4 = -2$

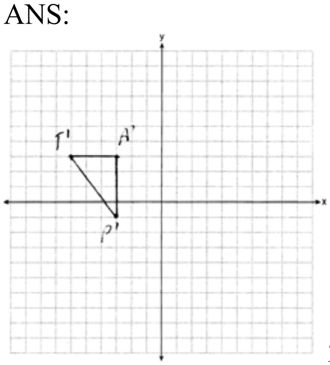
PTS: 2 REF: 011107ge STA: G.G.54 TOP: Translations

466 ANS: 1

$(x, y) \to (x + 3, y + 1)$

PTS: 2 REF: fall0803ge STA: G.G.54 TOP: Translations

467 ANS:



$T'(-6, 3), A'(-3, 3), P'(-3, -1)$

PTS: 2 REF: 061229ge STA: G.G.54 TOP: Translations

468 ANS:
$A'(2,2), B'(3,0), C(1,-1)$

PTS: 2 REF: 081329ge STA: G.G.58 TOP: Dilations

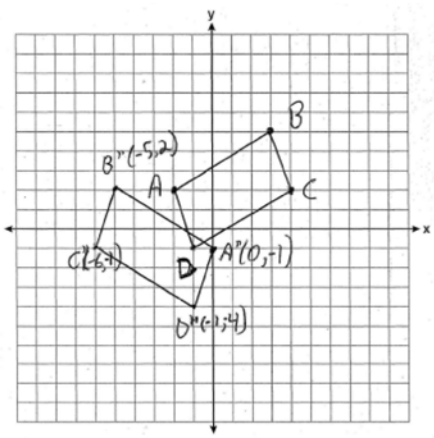
469 ANS: 1
$A'(2,4)$

PTS: 2 REF: 011023ge STA: G.G.54 TOP: Compositions of Transformations
KEY: basic

470 ANS: 3
$(3,-2) \rightarrow (2,3) \rightarrow (8,12)$

PTS: 2 REF: 011126ge STA: G.G.54 TOP: Compositions of Transformations
KEY: basic

471 ANS:

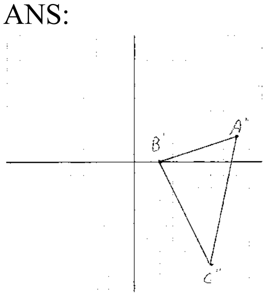


PTS: 4 REF: 060937ge STA: G.G.54 TOP: Compositions of Transformations
KEY: grids

472 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

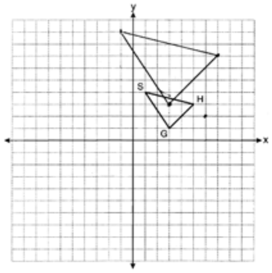
473 ANS:



$A''(8,2)$, $B''(2,0)$, $C''(6,-8)$

PTS: 4 REF: 081036ge STA: G.G.58 TOP: Compositions of Transformations

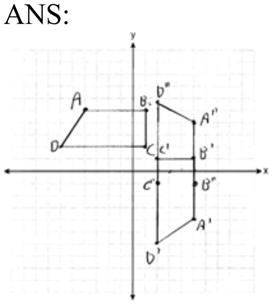
474 ANS:



$G''(3,3), H''(7,7), S''(-1,9)$

PTS: 4 REF: 081136ge STA: G.G.58 TOP: Compositions of Transformations

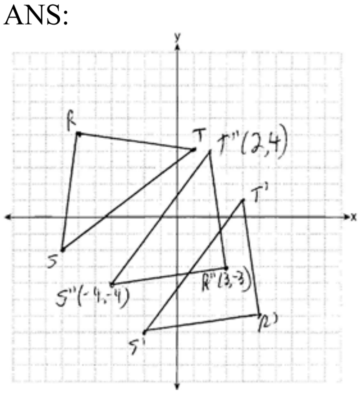
475 ANS:



$A'(5,-4)$, $B'(5,1)$, $C'(2,1)$, $D'(2,-6)$; $A''(5,4)$, $B''(5,-1)$, $C''(2,-1)$, $D''(2,6)$

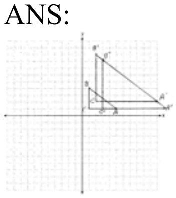
PTS: 4 REF: 061236ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

476 ANS:



PTS: 4 REF: 081236ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

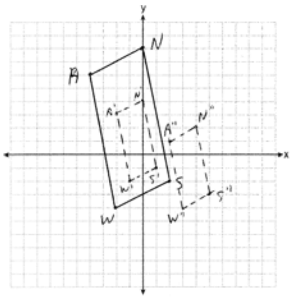
477 ANS:



$A''(11,1)$, $B''(3,7)$, $C''(3,1)$

PTS: 4 REF: 011336ge STA: G.G.58 TOP: Compositions of Transformations

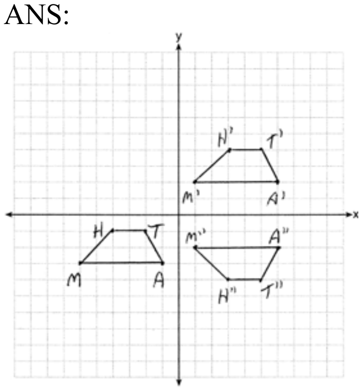
478 ANS:



$S''(5,-3)$, $W''(3,-4)$, $A''(2,1)$, and $N''(4,2)$

PTS: 4 REF: 061335ge STA: G.G.58 TOP: Compositions of Transformations
KEY: grids

479 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

480 ANS: 2 PTS: 2 REF: 011003ge STA: G.G.55
TOP: Properties of Transformations

481 ANS: 1 PTS: 2 REF: 061005ge STA: G.G.55
TOP: Properties of Transformations

482 ANS: 1 PTS: 2 REF: 061307ge STA: G.G.55
TOP: Properties of Transformations

483 ANS: 2 PTS: 2 REF: 081015ge STA: G.G.55
TOP: Properties of Transformations

484 ANS: 2 PTS: 2 REF: 011211ge STA: G.G.55
TOP: Properties of Transformations

485 ANS: 1 PTS: 2 REF: 011102ge STA: G.G.55
TOP: Properties of Transformations

486 ANS: 3 PTS: 2 REF: 081104ge STA: G.G.55
TOP: Properties of Transformations

487 ANS: 2 PTS: 2 REF: 081202ge STA: G.G.55
TOP: Properties of Transformations

488 ANS: 4
Distance is preserved after a rotation.

PTS: 2 REF: 081304ge STA: G.G.55 TOP: Properties of Transformations

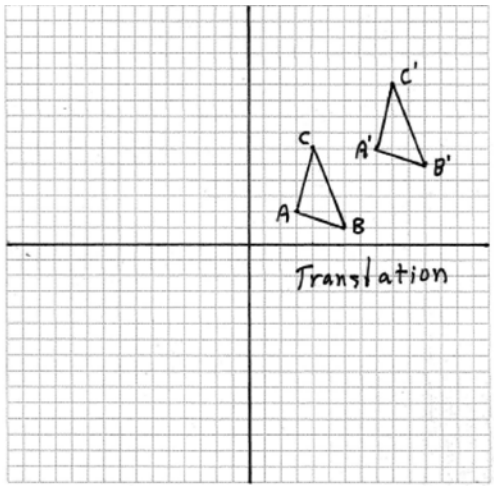
489 ANS:
Distance is preserved after the reflection. $2x + 13 = 9x - 8$

$$21 = 7x$$

$$3 = x$$

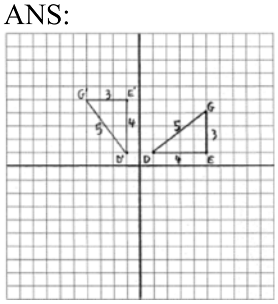
PTS: 2 REF: 011329ge STA: G.G.55 TOP: Properties of Transformations

490 ANS:



PTS: 2 REF: fall0830ge STA: G.G.55 TOP: Properties of Transformations

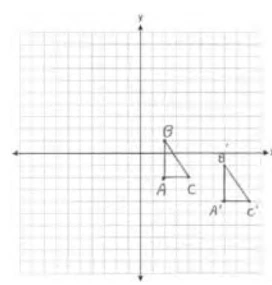
491 ANS:



$D'(-1, 1)$, $E'(-1, 5)$, $G'(-4, 5)$

PTS: 4 REF: 080937ge STA: G.G.55 TOP: Properties of Transformations

492 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

493 ANS: 3 PTS: 2 REF: 081021ge STA: G.G.57
TOP: Properties of Transformations

494 ANS: 2 PTS: 2 REF: 061201ge STA: G.G.59
TOP: Properties of Transformations
495 ANS: 3 PTS: 2 REF: 081204ge STA: G.G.59
TOP: Properties of Transformations
496 ANS: 2 PTS: 2 REF: 061126ge STA: G.G.59
TOP: Properties of Transformations
497 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
498 ANS: 1 PTS: 2 REF: 060903ge STA: G.G.56
TOP: Identifying Transformations
499 ANS: 4 PTS: 2 REF: 080915ge STA: G.G.56
TOP: Identifying Transformations
500 ANS: 4 PTS: 2 REF: 061018ge STA: G.G.56
TOP: Identifying Transformations
501 ANS: 3 PTS: 2 REF: 061122ge STA: G.G.56
TOP: Identifying Transformations
502 ANS: 2 PTS: 2 REF: 061227ge STA: G.G.56
TOP: Identifying Transformations
503 ANS: 3 PTS: 2 REF: 011304ge STA: G.G.56
TOP: Identifying Transformations
504 ANS: 2 PTS: 2 REF: 011006ge STA: G.G.56
TOP: Identifying Transformations
505 ANS: 4 PTS: 2 REF: 061015ge STA: G.G.56
TOP: Identifying Transformations
506 ANS:
Yes. A reflection is an isometry.

PTS: 2 REF: 061132ge STA: G.G.56 TOP: Identifying Transformations
507 ANS: 3 PTS: 2 REF: 060908ge STA: G.G.60
TOP: Identifying Transformations
508 ANS: 4 PTS: 2 REF: 061103ge STA: G.G.60
TOP: Identifying Transformations
509 ANS: 2
A dilation affects distance, not angle measure.

PTS: 2 REF: 080906ge STA: G.G.60 TOP: Identifying Transformations
510 ANS: 4 PTS: 2 REF: fall0818ge STA: G.G.61
TOP: Analytical Representations of Transformations
511 ANS: 1
Translations and reflections do not affect distance.

PTS: 2 REF: 080908ge STA: G.G.61
TOP: Analytical Representations of Transformations

512 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
513 ANS: 1 PTS: 2 REF: 011303ge STA: G.G.24
TOP: Statements
514 ANS: 2 PTS: 2 REF: 081301ge STA: G.G.24
TOP: Statements
515 ANS: 4 PTS: 2 REF: fall0802ge STA: G.G.24
TOP: Negations
516 ANS: 3 PTS: 2 REF: 080924ge STA: G.G.24
TOP: Negations
517 ANS: 2 PTS: 2 REF: 061002ge STA: G.G.24
TOP: Negations
518 ANS: 1 PTS: 2 REF: 011213ge STA: G.G.24
TOP: Negations
519 ANS: 2 PTS: 2 REF: 061202ge STA: G.G.24
TOP: Negations
520 ANS: 1 PTS: 2 REF: 081303ge STA: G.G.24
TOP: Negations
521 ANS:
The medians of a triangle are not concurrent. False.

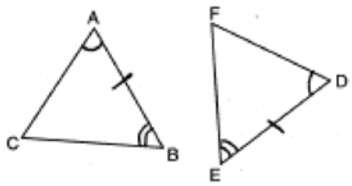
PTS: 2 REF: 061129ge STA: G.G.24 TOP: Negations
522 ANS:
2 is not a prime number, false.

PTS: 2 REF: 081229ge STA: G.G.24 TOP: Negations
523 ANS: 4 PTS: 2 REF: 011118ge STA: G.G.25
TOP: Compound Statements KEY: general
524 ANS: 4 PTS: 2 REF: 081101ge STA: G.G.25
TOP: Compound Statements KEY: conjunction
525 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.

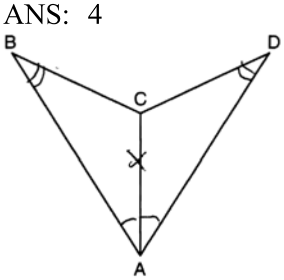
PTS: 2 REF: 060933ge STA: G.G.25 TOP: Compound Statements
KEY: disjunction
526 ANS: 3 PTS: 2 REF: 011028ge STA: G.G.26
TOP: Conditional Statements
527 ANS: 1 PTS: 2 REF: 061009ge STA: G.G.26
TOP: Converse and Biconditional
528 ANS: 1 PTS: 2 REF: 061314ge STA: G.G.26
TOP: Converse and Biconditional
529 ANS: 4 PTS: 2 REF: 081318ge STA: G.G.26
TOP: Converse and Biconditional

530 ANS: 4 PTS: 2 REF: 060913ge STA: G.G.26
TOP: Conditional Statements
531 ANS: 3 PTS: 2 REF: 081026ge STA: G.G.26
TOP: Contrapositive
532 ANS: 1 PTS: 2 REF: 011320ge STA: G.G.26
TOP: Conditional Statements
533 ANS:
Contrapositive-If two angles of a triangle are not congruent, the sides opposite those angles are not congruent.

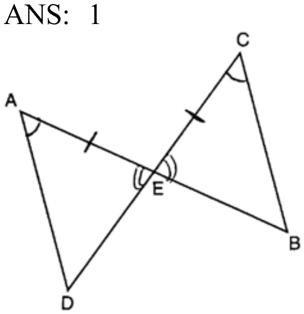
PTS: 2 REF: fall0834ge STA: G.G.26 TOP: Conditional Statements
534 ANS: 3



PTS: 2 REF: 060902ge STA: G.G.28 TOP: Triangle Congruency
535 ANS: 1 PTS: 2 REF: 011122ge STA: G.G.28
TOP: Triangle Congruency
536 ANS: 4

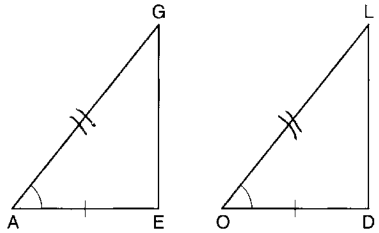


PTS: 2 REF: 081114ge STA: G.G.28 TOP: Triangle Congruency
537 ANS: 1



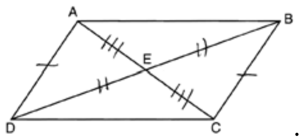
PTS: 2 REF: 081210ge STA: G.G.28 TOP: Triangle Congruency
538 ANS: 3 PTS: 2 REF: 080913ge STA: G.G.28
TOP: Triangle Congruency

539 ANS: 2



PTS: 2 REF: 081007ge STA: G.G.28 TOP: Triangle Congruency

540 ANS: 3

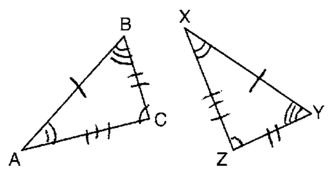


. Opposite sides of a parallelogram are congruent and the diagonals of a parallelogram bisect each other.

PTS: 2 REF: 061222ge STA: G.G.28 TOP: Triangle Congruency

541 ANS: 4 PTS: 2 REF: 080905ge STA: G.G.29
TOP: Triangle Congruency

542 ANS: 4



PTS: 2 REF: 081001ge STA: G.G.29 TOP: Triangle Congruency

543 ANS: 2 PTS: 2 REF: 081102ge STA: G.G.29
TOP: Triangle Congruency

544 ANS: 4 PTS: 2 REF: 011216ge STA: G.G.29
TOP: Triangle Congruency

545 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

546 ANS: 3 PTS: 2 REF: 061102ge STA: G.G.29
TOP: Triangle Congruency

547 ANS: 3 PTS: 2 REF: 081309ge STA: G.G.29
TOP: Triangle Congruency

548 ANS: 1 PTS: 2 REF: 011301ge STA: G.G.29
TOP: Triangle Congruency

549 ANS: 2

$$AC = BD$$
$$AC - BC = BD - BC$$
$$AB = CD$$

PTS: 2 REF: 061206ge STA: G.G.27 TOP: Line Proofs

550 ANS: 4 PTS: 2 REF: 011108ge STA: G.G.27
TOP: Angle Proofs

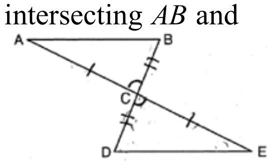
551 ANS: 1

$$AB = CD$$
$$AB + BC = CD + BC$$
$$AC = BD$$

PTS: 2 REF: 081207ge STA: G.G.27 TOP: Triangle Proofs

552 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. $\Delta ABC \cong \Delta EDC$ 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

553 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. $\Delta ABE \cong \Delta DCE$ because of ASA. $\overline{AB} \cong \overline{DC}$ because CPCTC.

PTS: 4 REF: 061235ge STA: G.G.27 TOP: Triangle Proofs

554 ANS:

ΔMAH, $\overline{MH} \cong \overline{AH}$ and medians $\overline{AB}$ and $\overline{MT}$ are given. $\overline{MA} \cong \overline{AM}$ (reflexive property). ΔMAH 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). $m\overline{MB} = \frac{1}{2} m\overline{MH}$ and $m\overline{AT} = \frac{1}{2} m\overline{AH}$ (definition of midpoint). $\overline{MB} \cong \overline{AT}$ (multiplication postulate). $\Delta MBA \cong \Delta ATM$ (SAS). $\angle MBA \cong \angle ATM$ (CPCTC).

PTS: 6 REF: 061338ge STA: G.G.27 TOP: Triangle Proofs

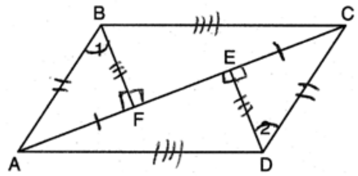
555 ANS:

ΔABC, $\overline{BD}$ 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). $\Delta CDB \cong \Delta ADB$ (SAS). $\overline{AB} \cong \overline{CB}$ (CPCTC).

PTS: 4 REF: 081335ge STA: G.G.27 TOP: Triangle Proofs

556 ANS: 3 PTS: 2 REF: 081208ge STA: G.G.27
TOP: Quadrilateral Proofs

557 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

558 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

559 ANS:

Quadrilateral *ABCD*, $\overline{AD} \cong \overline{BC}$ and $\angle DAE \cong \angle BCE$ are given. $\overline{AD} \parallel \overline{BC}$ 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

560 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

561 ANS:

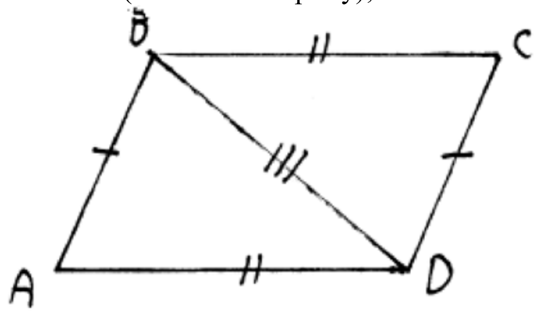
Because $\overline{AB} \parallel \overline{DC}$, $\overset{\frown}{AD} \cong \overset{\frown}{BC}$ since parallel chords intersect congruent arcs. $\angle BDC \cong \angle ACD$ because inscribed angles that intercept congruent arcs are congruent. $\overline{AD} \cong \overline{BC}$ since congruent chords intersect congruent arcs. $\overline{DC} \cong \overline{CD}$ because of the reflexive property. Therefore, $\triangle ACD \cong \triangle BDC$ because of SAS.

PTS: 6 REF: fall0838ge STA: G.G.27 TOP: Circle Proofs

562 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

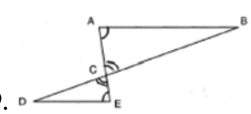
563 ANS:
$\overline{BD} \cong \overline{DB}$ (Reflexive Property); $\triangle ABD \cong \triangle CDB$ (SSS); $\angle BDC \cong \angle ABD$ (CPCTC).



PTS: 4 REF: 061035ge STA: G.G.27 TOP: Quadrilateral Proofs

564 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

565 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

566 ANS: 4 PTS: 2 REF: 011019ge STA: G.G.44
TOP: Similarity Proofs

567 ANS: 2 PTS: 2 REF: 061324ge STA: G.G.44
TOP: Similarity Proofs

568 ANS: 3 PTS: 2 REF: 011209ge STA: G.G.44
TOP: Similarity Proofs

569 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

570 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