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REGENTS BY TYPE

The NY Geometry Regents Exam Questions
from Spring 2014 to August 2025 Sorted by Type

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Geometry Multiple Choice Regents Exam Questions

1 Which equation represents a line parallel to the line represented $y = 4x + 6$ and passing through the point $(-3, 2)$?

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

2 The line $4x - 6y = 24$ is transformed by a dilation of scale factor 3 centered at the origin. Which equation represents the image of the line after this dilation?

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

3 Line h is represented by the equation $y = \frac{2}{3}x - 4$.

Which equation represents the line that is perpendicular to line h and passes through the point $(6, 1)$?

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

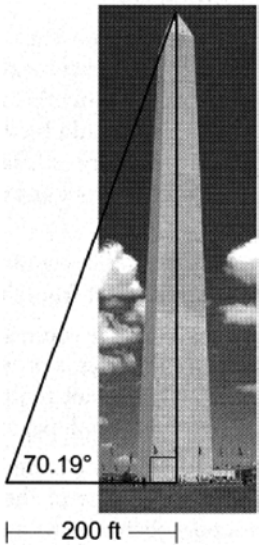
4 An equation of a circle is $x^2 + y^2 - 6x + 2y = 14$. What are the coordinates of the center and the length of the radius of this circle?

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

5 The perimeter of a triangle is 18. What is the perimeter of a similar triangle after a dilation with scale factor of 3?

1) 6
2) 18
3) 54
4) 162

6 The Washington Monument, shown below, is in Washington, D.C. At a point on the ground 200 feet from the center of the base of the monument, the angle of elevation to the top of the monument is 70.19°.



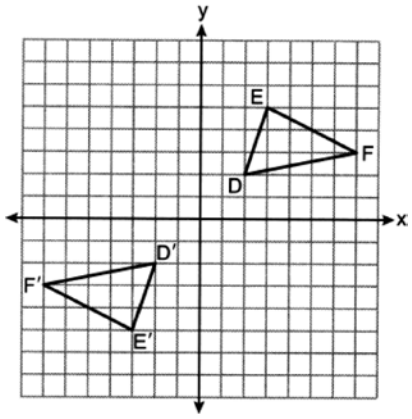
What is the height of the monument, to the *nearest foot*?

1) 188
2) 213
3) 555
4) 590

7 A regular octagon is rotated about its center. Which angle measure will carry the octagon onto itself?

1) 36°
2) 90°
3) 144°
4) 160°

8 On the set of axes below, $\triangle D'E'F'$ is the image of $\triangle DEF$.



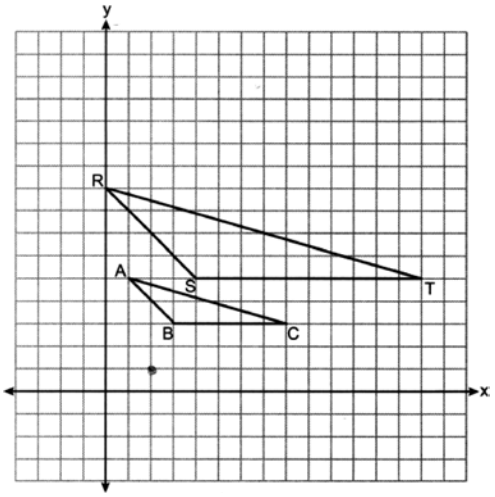
A transformation that maps $\triangle DEF$ onto $\triangle D'E'F'$ is a
1) reflection over the line $y = x$
2) reflection over the line $y = -x$
3) point reflection through the origin
4) translation 4 units left and 4 units down

9 A parallelogram must be a rectangle if its diagonals
1) are perpendicular
2) bisect each other
3) bisect its angles
4) are congruent

10 Which two-dimensional figure is always formed when a plane intersects a right cylinder perpendicular to its base?
1) circle
2) triangle
3) rhombus
4) rectangle

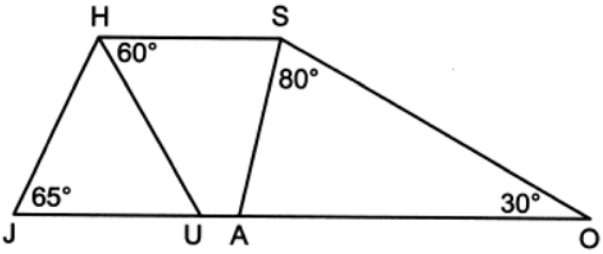
11 In right triangle JOE, hypotenuse $JO = 31.8$ and $m\angle J = 38°$. To the *nearest tenth*, the length of $\overline{EJ}$ is
1) 19.6
2) 25.1
3) 40.4
4) 51.7

12 Triangle ABC is dilated by a scale factor of 2 to map onto its image, $\triangle RST$, on the set of axes below.



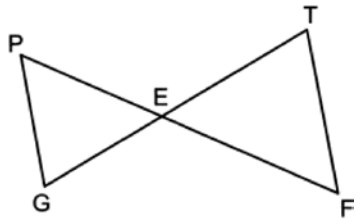
What are the coordinates of the center of this dilation?
1) $(1,-1)$
2) $(2,1)$
3) $(3,3)$
4) $(0,0)$

13 Trapezoid $JOSH$, shown below, has non-parallel sides $\overline{JH}$ and $\overline{OS}$, $m\angle J = 65°$, $m\angle O = 30°$, $m\angle OSA = 80°$, and $m\angle SHU = 60°$.



What is $m\angle HSA$?
1) 55°
2) 60°
3) 65°
4) 70°

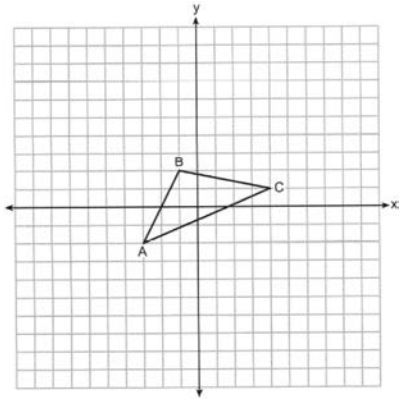
14 In the diagram below, $\overline{GT}$ and $\overline{PF}$ intersect at E, and $\angle P \cong \angle F$.



Which equation is always true?

1) $\frac{PE}{FE} = \frac{FT}{PG}$
2) $\frac{GE}{TE} = \frac{FT}{PG}$
3) $\frac{PE}{GE} = \frac{TE}{FE}$
4) $\frac{PE}{FE} = \frac{PG}{FT}$

15 Triangle ABC, with vertices whose coordinates are $A(-3,-2)$, $B(-1,2)$, and $C(4,1)$, is graphed on the set of axes below.



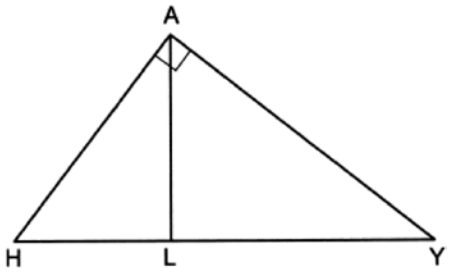
Triangle $A'B'C'$, whose vertices have coordinates $A'(-6,-2)$, $B'(-2,2)$, and $C'(8,1)$, is the image of $\triangle ABC$. The transformation that maps $\triangle ABC$ onto $\triangle A'B'C'$ is a

1) dilation
2) translation
3) vertical stretch
4) horizontal stretch

16 A cone has a height of 8 inches and volume of 75.4 cubic inches. What is the diameter of the cone, to the *nearest inch*?

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

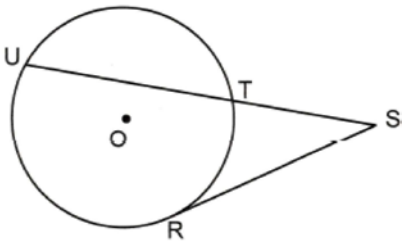
17 In right triangle HAY below, altitude $\overline{AL}$ is drawn to hypotenuse $\overline{HY}$.



If $HY = 25$ and $YA = 20$, the length of $\overline{AL}$ is

1) 9
2) 12
3) 15
4) 16

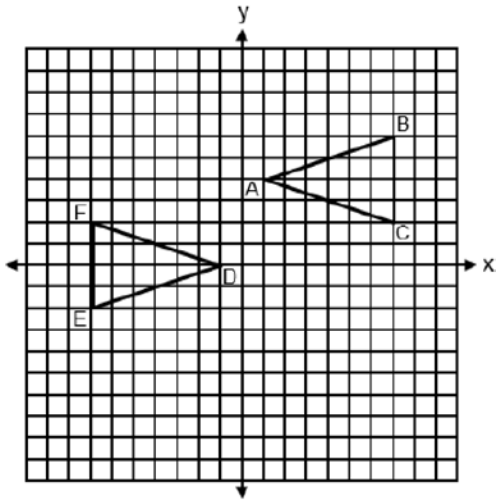
18 In the diagram below, tangent $\overline{SR}$ and secant $\overline{STU}$ are drawn to circle O from external point S.



If $\overset{\frown}{TU} \cong \overset{\frown}{RU}$ and $m\overset{\frown}{TR} = 68°$, what is $m\angle S$?

1) 22°
2) 34°
3) 39°
4) 78°

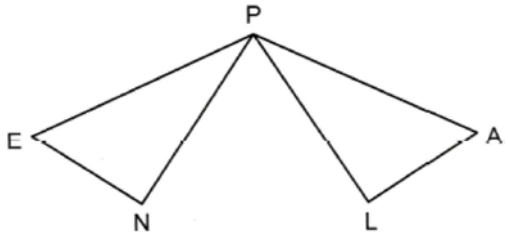
19 Triangles ABC and DEF are graphed on the set of axes below.



Which sequence of rigid motions maps $\triangle ABC$ onto $\triangle DEF$?

1) A reflection over $y = -x + 2$.
2) A point reflection through $(0,2)$.
3) A translation 2 units left followed by a reflection over the x-axis.
4) A translation 4 units down followed by a reflection over the y-axis.

20 In the diagram below, congruent triangles PEN and PAL are drawn.



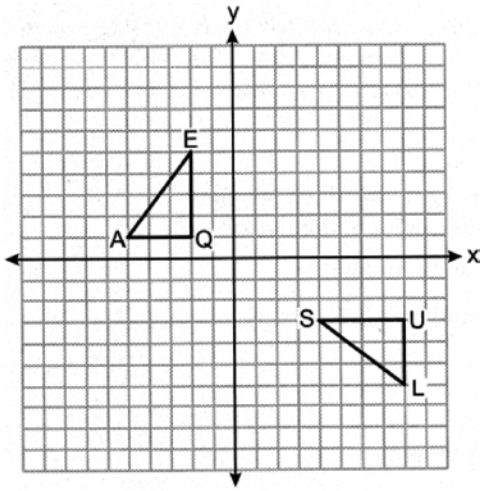
Which rigid motion maps $\triangle PEN$ onto $\triangle PAL$?

1) a point reflection of $\triangle PEN$ through P
2) a reflection of $\triangle PEN$ over the angle bisector of $\angle EPA$
3) a rotation of $\triangle PEN$ about point P, mapping $\overline{PE}$ onto $\overline{PA}$
4) a translation of $\triangle PEN$ along $\overline{EA}$, mapping point E onto A

21 The line represented by the equation $5x - 2y = 10$ is transformed by a dilation centered at $(2,0)$ with a scale factor of 2. The image of the line

1) is the original line
2) passes through the point $(4,0)$
3) passes through the point $(0,-10)$
4) is perpendicular to the original line

22 On the set of axes below, $\triangle EQA$ and $\triangle SUL$ are graphed.



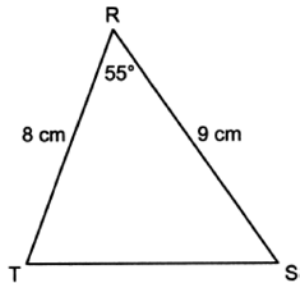
Which sequence of transformations shows that $\triangle EQA \cong \triangle SUL$?

1) Rotate $\triangle EQA$ 90º counterclockwise about the origin and then translate 9 units right and 1 unit down.
2) Rotate $\triangle EQA$ 90º counterclockwise about the origin and then reflect over the line $x = 4$.
3) Reflect $\triangle EQA$ over the x-axis and then rotate clockwise about the origin.
4) Translate $\triangle EQA$ 10 units right and then reflect over the line $x = -1$.

23 If two sides of a triangle have lengths of 2 and 8, the length of the third side could be

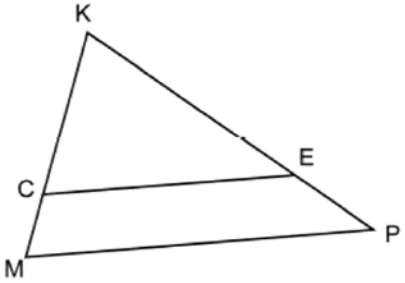
1) 10
2) 7
3) 6
4) 4

24 In $\triangle RST$ below, $RS = 9$ cm, $RT = 8$ cm, and $m\angle TRS = 55°$.



What is the area of $\triangle RST$, to the *nearest square centimeter*?
1) 59
2) 36
3) 29
4) 21

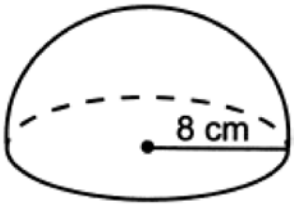
25 In $\triangle KMP$ below, $\overline{CE}$ is drawn parallel to $\overline{MP}$.



If $KC = 8$, $CM = 3$, and $CE = 12$, what is the length of $\overline{MP}$?
1) 24
2) 16.5
3) 15
4) 4.5

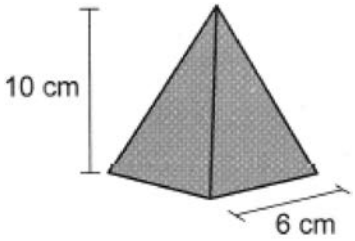
26 Triangle RST has $m\angle S = 33°$, $RS = 7$, and $ST = 12$. What is the area of $\triangle RST$, to the *nearest tenth*?
1) 22.9
2) 27.3
3) 35.2
4) 45.7

27 The hemisphere below has a radius of 8 cm.



To the *nearest cubic centimeter*, the volume of the hemisphere is
1) 201
2) 268
3) 1072
4) 2145

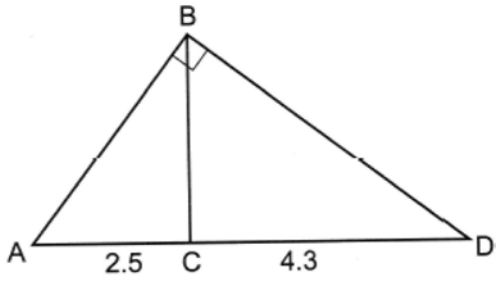
28 A candle can be modeled by a pyramid with a square base, as shown below. The height of the candle is 10 cm, and each side of the base measures 6 cm.



If the candle wax burns at a rate of 3.5 cubic centimeters per hour, what is the approximate number of hours this candle could burn?
1) 103
2) 51
3) 34
4) 11

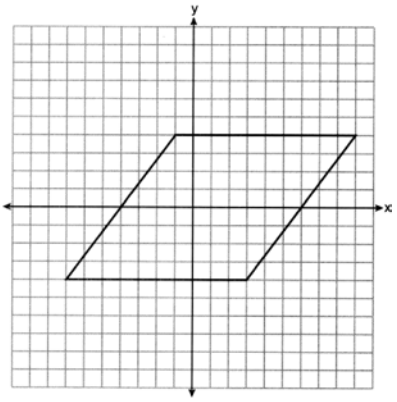
29 Point O divides $\overline{COA}$ such that $CO:OA = 1:4$. If C has coordinates $(-2,-9)$ and A has coordinates $(3,6)$, the coordinates of O are
1) $(2,3)$
2) $(1,0)$
3) $(0,-3)$
4) $(-1,-6)$

30 In right triangle ABD below, altitude $\overline{BC}$ is drawn to hypotenuse $\overline{AD}$, $AC = 2.5$, and $CD = 4.3$.



What is the length of $\overline{BA}$, to the *nearest tenth*?
1) 3.3
2) 3.4
3) 4.1
4) 5.4

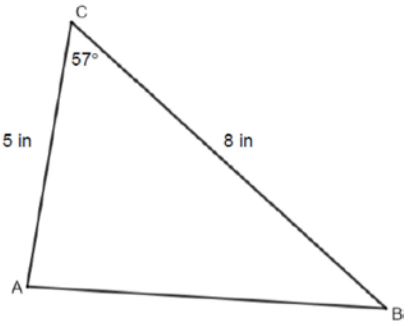
31 A rhombus is graphed on the set of axes below.



Which transformation does *not* carry the rhombus onto itself?
1) a rotation of 180º about the origin
2) a rotation of 180º about point $(1,0)$
3) a reflection over the line $y = \frac{1}{2}x - \frac{1}{2}$
4) a reflection over the line $y = -2x + 2$

32 Trapezoid $ZOYD$ has parallel sides $\overline{ZO}$ and $\overline{DY}$. If $m\angle Z = 141°$ and $m\angle Y = 73°$, what is $m\angle D$?
1) 39º
2) 73º
3) 107º
4) 141º

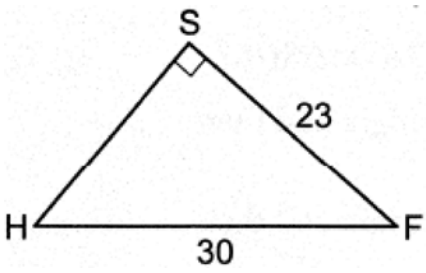
33 In non-right triangle ABC shown below, $AC = 5$ in, $BC = 8$ in, and $m\angle C = 57°$.



What is the area of $\triangle ABC$, to the *nearest tenth of a square inch*?
1) 10.9
2) 16.8
3) 21.8
4) 33.5

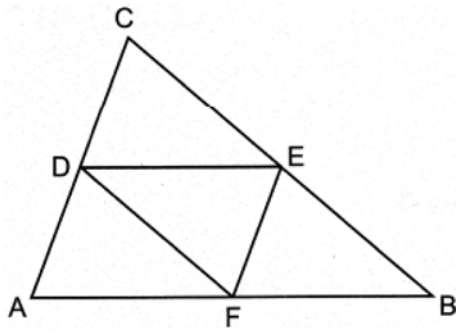
34 Triangle DUG is an isosceles right triangle with the right angle at G. If $DU = 10\sqrt{2}$, what is the length of $\overline{GU}$?
1) 5
2) $5\sqrt{2}$
3) 10
4) $10\sqrt{2}$

35 In $\triangle HSF$ below, $m\angle S = 90°$, $HF = 30$, and $FS = 23$.



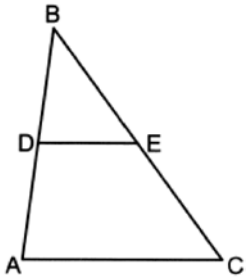
What is $m\angle F$, to the *nearest degree*?
1) 53°
2) 50°
3) 40°
4) 37°

36 In $\triangle CAB$ below, midsegments $\overline{DE}$, $\overline{EF}$, and $\overline{FD}$ are drawn.



If $CA = 14$, $CB = 20$, and $FB = 9$, what is the perimeter of quadrilateral $DEFA$?
1) 26
2) 32
3) 44
4) 52

37 In $\triangle ABC$ below, midsegment $\overline{DE}$ is drawn.



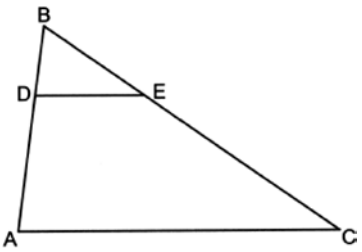
If $DE = x + 3$ and $AC = 3x - 5$, what is the length of $\overline{DE}$?
1) 28
2) 14
3) 7
4) 4

38 An equilateral triangle is continuously rotated around one of its altitudes. The three-dimensional object formed is a
1) cone
2) sphere
3) cylinder
4) pyramid

39 Triangle ABC is translated 5 units to the left and 2 units up to map onto $\triangle PQR$. Which statement is *not* always true?
1) $\triangle PQR \cong \triangle ABC$
2) $\angle A \cong \angle Q$
3) $BQ = \sqrt{29}$
4) $RQ = CB$

40 A section of sidewalk in the shape of a rectangular prism is being replaced. The sidewalk is 10 feet long, 4 feet wide, and 4 inches deep. A brand of concrete mix yields 0.6 cubic foot of concrete per bag. What is the minimum number of bags of concrete mix that must be purchased to completely replace this sidewalk?
1) 22
2) 23
3) 26
4) 27

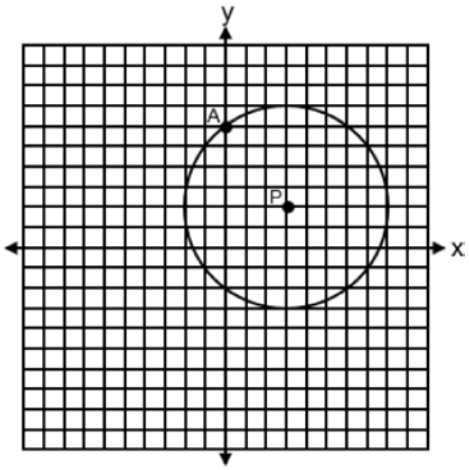
41 In $\triangle ABC$ below, points D and E are on $\overline{AB}$ and $\overline{CB}$, respectively, such that $\overline{DE} \parallel \overline{AC}$.



If $AD = 8$, $DB = 4$, and $DE = 6$, what is the length of $\overline{AC}$?
1) 24
2) 18
3) 12
4) 10

42 What is the perimeter of $\triangle ABC$, where the vertices have coordinates $A(-2,3)$, $B(-2,-1)$, and $C(6,-1)$?
1) 16
2) 92
3) $16\sqrt{5}$
4) $12 + 4\sqrt{5}$

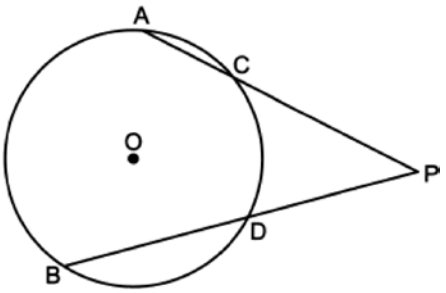
43 Circle P with center at $(3,2)$ and passing through $A(0,6)$ is graphed on the set of axes below.



An equation of circle P is

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

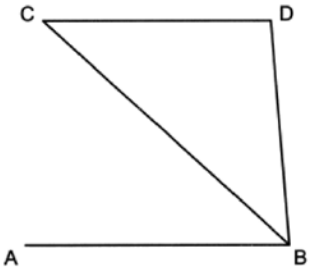
44 In circle O below, secants $\overline{PCA}$ and $\overline{PDB}$ are drawn from external point P.



If $PA = 17$, $PD = 10$, and $BD = 12$, what is the length of $\overline{PC}$, to the *nearest tenth*?

1) 7.1
2) 7.7
3) 12.9
4) 14.2

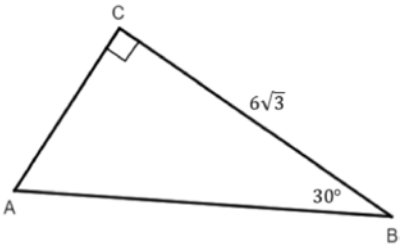
45 In the diagram below, $\overline{CD} \parallel \overline{AB}$, and $\overline{CB}$ bisects $\angle ABD$.



Which statement must be true?

1) $\overline{CD} \cong \overline{AB}$
2) $\overline{AB} \cong \overline{BD}$
3) $\triangle CDB$ is a right triangle
4) $\triangle CDB$ is an isosceles triangle

46 In right triangle ABC below, $m\angle C = 90°$, $m\angle B = 30°$, and $CB = 6\sqrt{3}$.



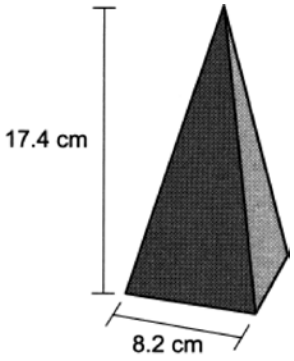
The length of $\overline{AB}$ is

1) $3\sqrt{3}$
2) 9
3) 12
4) $12\sqrt{3}$

47 A spherical balloon is fully inflated with helium to a diameter of 1.7 feet. If helium costs \$0.80 per cubic foot, what is the cost to completely fill the balloon with helium?

1) \$2.06
2) \$2.42
3) \$3.22
4) \$16.46

48 A wooden toy block can be modeled by a pyramid with a square base, as shown below. The height of the block is 17.4 cm and the square base has a side length of 8.2 cm.



The block is made of solid oak, which has a density of 0.77 g/cm^3. What is the mass of the block, to the *nearest gram*?

1) 300
2) 506
3) 637
4) 901

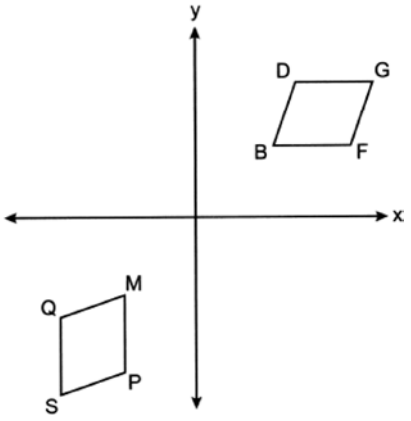
49 In parallelogram *ABCD*, diagonals $\overline{AC}$ and $\overline{BD}$ intersect at *E*. Which information is sufficient to prove *ABCD* is a rhombus?

1) $\overline{AE} \cong \overline{EC}$
2) $\overline{AC} \cong \overline{BD}$
3) $\overline{AB} \perp \overline{BC}$
4) $\overline{AC} \perp \overline{BD}$

50 Square *ABCD* has an area of 36. If the square is dilated by a scale factor of $\frac{1}{2}$ centered at *A*, what is the area of its image?

1) 9
2) 18
3) 72
4) 144

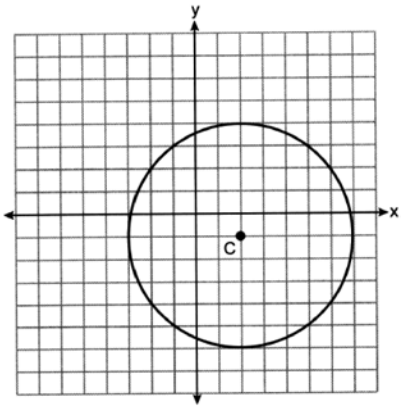
51 On the set of axes below, quadrilateral *BDGF* is rotated 90 degrees clockwise about the origin and then reflected over the *y*-axis. The image of quadrilateral *BDGF* is quadrilateral *MQSP*.



Side $\overline{BD}$ will always map onto

1) $\overline{MP}$
2) $\overline{PS}$
3) $\overline{MQ}$
4) $\overline{SQ}$

52 On the set of axes below, circle *C* has a center with coordinates $(2,-1)$.



Which equation represents circle *C*?

1) $(x-2)^2+(y+1)^2=25$
2) $(x-2)^2+(y+1)^2=16$
3) $(x+2)^2+(y-1)^2=25$
4) $(x+2)^2+(y-1)^2=16$

Geometry 2 Point Regents Exam Questions

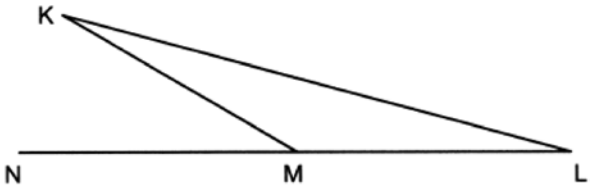
53 The table below lists five metals and their densities.

Metal	Density (g/cm^3)
Zinc	7.14
Tin	7.31
Iron	7.86
Copper	8.96
Silver	10.5

A solid metal cube has an edge length of 5 cm and a mass of 982.5 grams. Using the table above, determine and state the type of metal from which this cube is made.

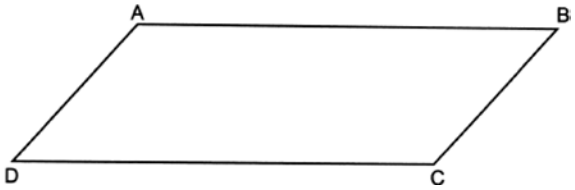
54 In the year 2020, the village of Depew, New York had an area of 5.1 square miles and a population of 15,069. In the same year, the village of Lancaster, New York had an area of 2.7 square miles and a population of 10,087. Which village had the larger population density in 2020? Justify your answer.

55 Angle KML is the vertex angle of isosceles triangle KLM below. Side $\overline{LM}$ is extended through vertex M to point N.

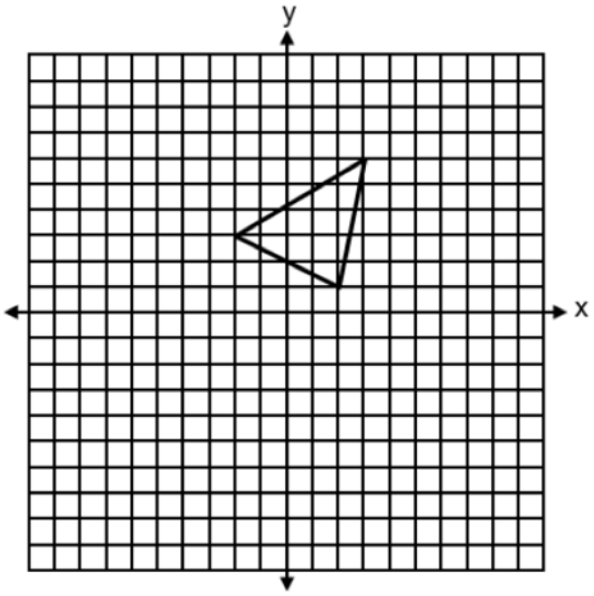


If $m\angle K = 15°$, determine and state $m\angle KMN$.

56 Parallelogram $ABCD$ is shown below. Using a compass and straightedge, construct the altitude from point A to side $\overline{DC}$. [Leave all construction marks.]

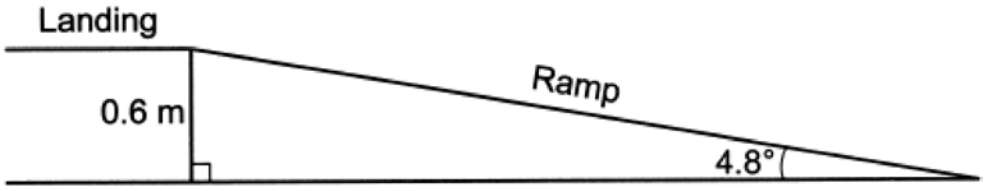


57 A triangle with vertices at (–2,3), (3,6), and (2,1), is graphed on the set of axes below. A horizontal stretch of scale factor 2 with respect to $x = 0$, is represented by $(x,y) \rightarrow (2x,y)$. Graph the image of this triangle, after the horizontal stretch on the same set of axes.



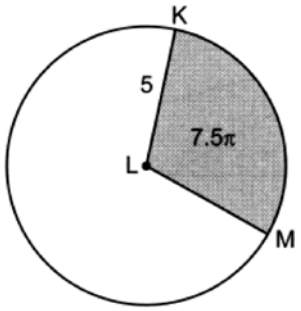
58 Triangle $D'A'N'$ is the image of $\triangle DAN$ after a translation. Explain why $\triangle D'A'N'$ must be congruent to $\triangle DAN$.

59 The ramp shown in the diagram below has an angle of elevation of 4.8º. The ramp is built to a landing 0.6 m above the ground.



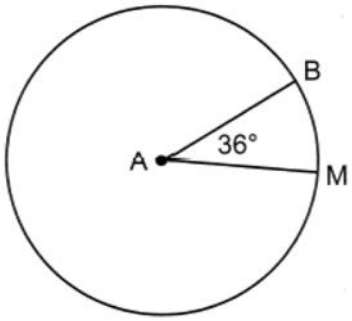
Determine and state the length of the ramp, to the *nearest tenth of a meter*.

60 In the diagram below of circle L, the area of the shaded sector KLM is 7.5π and $LK = 5$.



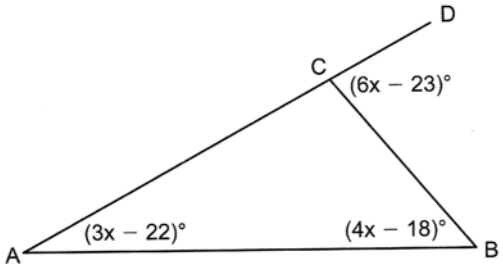
Determine and state the degree measure of angle KLM, the central angle of the shaded sector.

61 In circle A below, $m\angle BAM = 36°$.



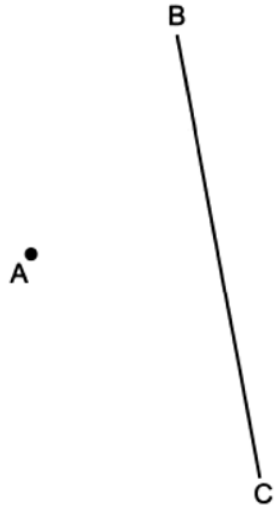
If $AB = 20$, determine and state the length of $\overset{\frown}{MB}$.
[Leave your answer in terms of π.]

62 In $\triangle ABC$ below, $\overline{AC}$ is extended through C to D, $m\angle A = (3x - 22)°$, $m\angle B = (4x - 18)°$, and $m\angle BCD = (6x - 23)°$.

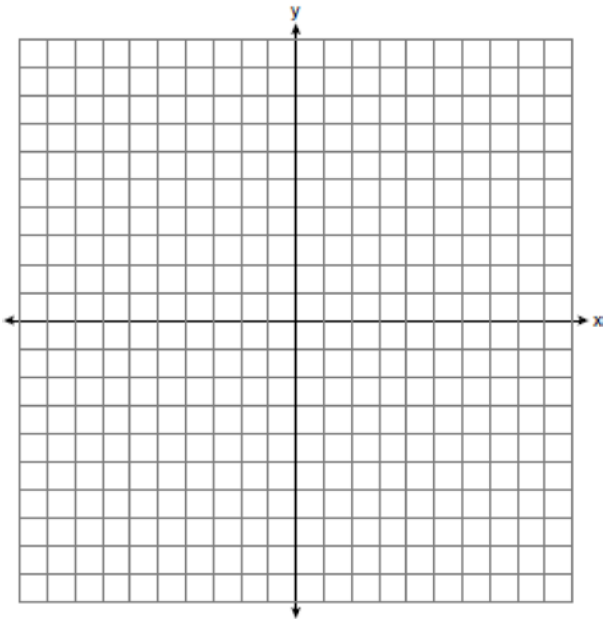


Determine and state $m\angle ACB$.

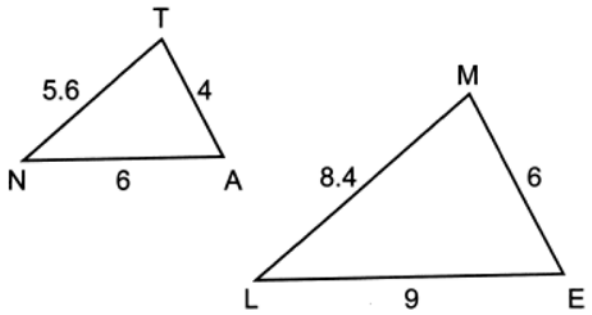
63 Using a compass and straightedge, construct the image of point A after a reflection over $\overline{BC}$.
[Leave all construction marks.]



64 The endpoints of $\overline{CAS}$ are $C(-3,1)$ and $S(7,6)$. Determine and state the coordinates of point A such that the ratio of $CA:AS$ is $3:2$. [The use of the set of axes below is optional.]



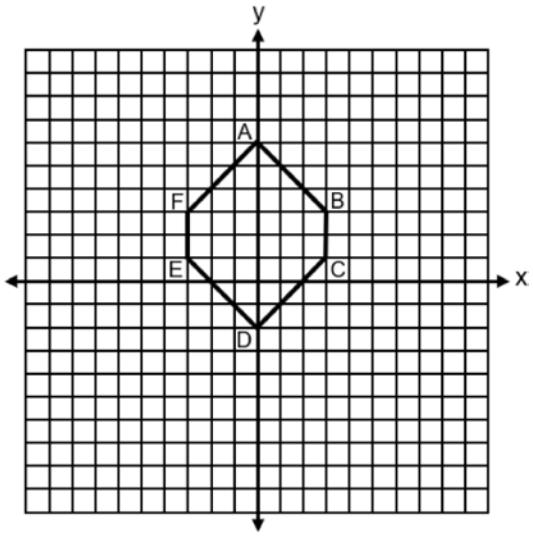
65 In triangles ANT and ELM below, $AN = 6$, $NT = 5.6$, $TA = 4$, $EL = 9$, $LM = 8.4$, and $ME = 6$.



Explain why $\triangle ANT \sim \triangle ELM$.

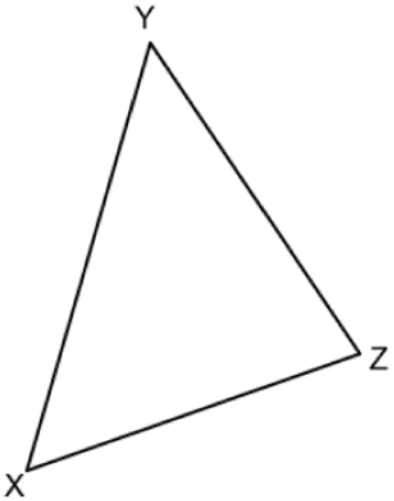
66 In a right triangle, the acute angles have the relationship $\sin(3x-7)^\circ = \cos(x+1)^\circ$. Determine and state the value of x.

67 Hexagon $ABCDEF$ with coordinates at $A(0,6)$, $B(3,3)$, $C(3,1)$, $D(0,-2)$, $E(-3,1)$, and $F(-3,3)$ is graphed on the set of axes below.

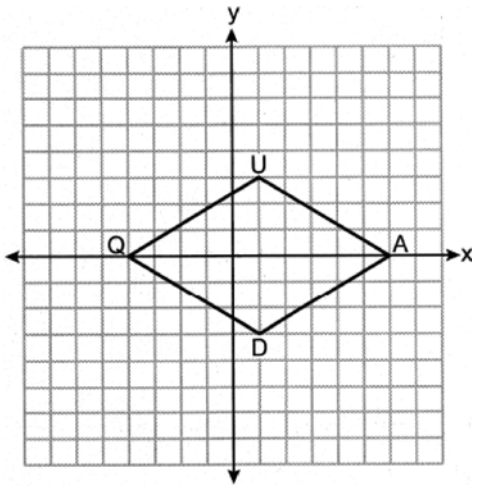


Determine and state the perimeter of $ABCDEF$ in simplest radical form.

68 Triangle XYZ is shown below. Using a compass and straightedge, construct the circumcenter of $\triangle XYZ$.



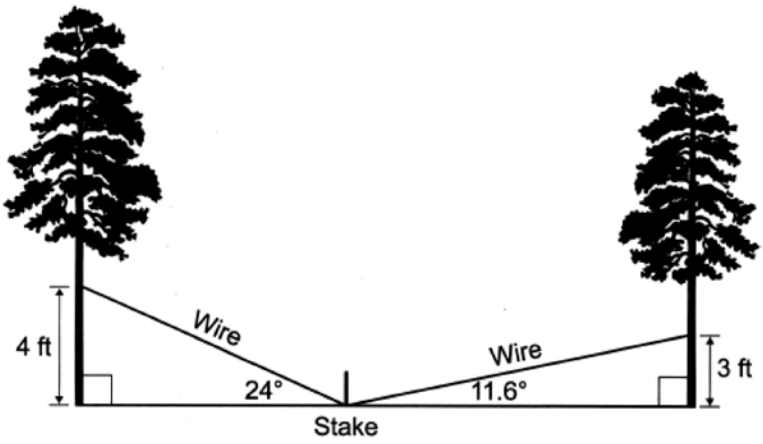
69 Quadrilateral *QUAD* is graphed on the set of axes below.



Determine and state the area of quadrilateral *QUAD*.

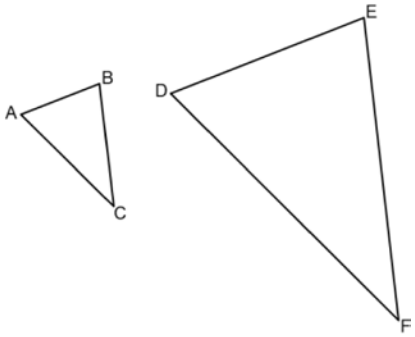
Geometry 4 Point Regents Exam Questions

70 A park ranger needs to secure two different trees with wire. A wire is to be attached from a stake in the ground to each tree. The wire is attached at two different heights and two different angles of elevation, as indicated in the model below.



The park ranger has 20 feet of wire. Does the park ranger have enough wire to secure both trees? Justify your answer.

71 In the diagram below, $\triangle ABC \sim \triangle DEF$.



If $AB = 4$, $BC = x - 1$, $DE = x + 3$, and $EF = 15$, determine and state the length of $\overline{DE}$.

72 Joan wants to fill an empty 75-liter fish tank with water. She uses a cylindrical bucket with a diameter of 20 cm. Determine and state the maximum number of buckets of water, filled to an exact height of 26 cm, Joan can put into the fish tank before it overflows. [1000 cm^3=1 liter]

73 A store sells colored craft sand in the three different containers below.

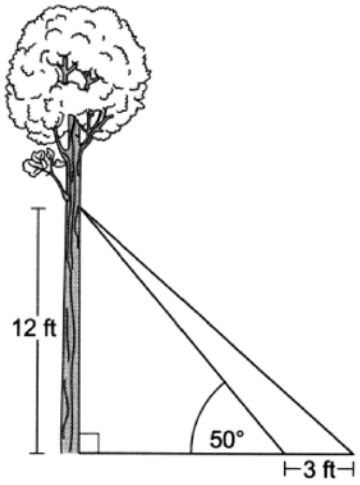
Container 1: A square prism with a base length of 4 inches and a height of 7.5 inches.

Container 2: A cylinder with a diameter of 5 inches and a height of 6 inches.

Container 3: A cone with a diameter of 7.5 inches and a height of 8.5 inches.

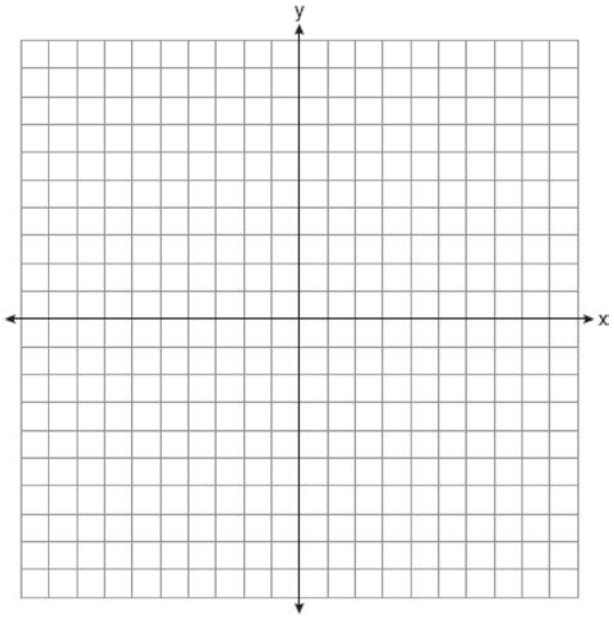
If the containers are filled to the top, which container will hold the most sand? Justify your answer.

74 As modeled in the diagram below, two cables are attached from a point on a tree 12 feet above the ground. The longer cable is anchored on the ground 3 feet farther from the tree than the shorter cable is anchored. The angle of elevation between the shorter cable and the ground is 50º.

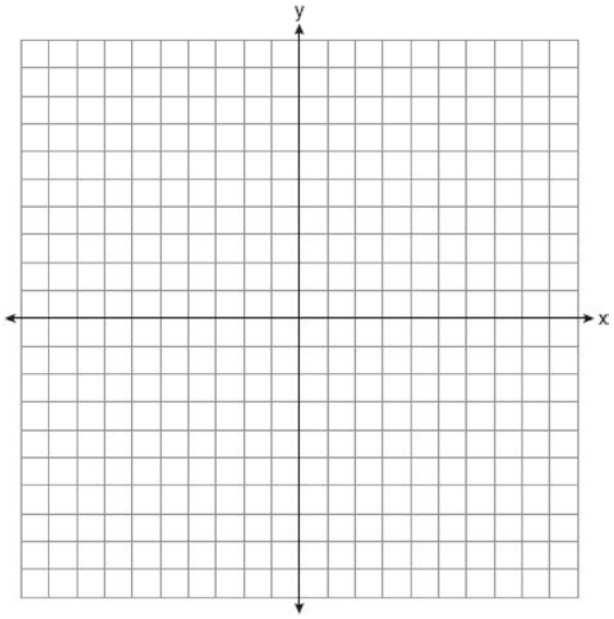


Determine and state, to the *nearest foot*, the distance from the base of the tree to the point where the longer cable is attached to the ground. Determine and state, to the *nearest degree*, the angle of elevation between the longer cable and the ground.

75 Quadrilateral *MIKE* has vertices with coordinates $M(-1,-3)$, $I(-3,3)$, $K(5,4)$, and $E(7,-2)$. Prove *MIKE* is a parallelogram, and prove *MIKE* is *not* a rhombus. [The use of the set of axes below is optional.]

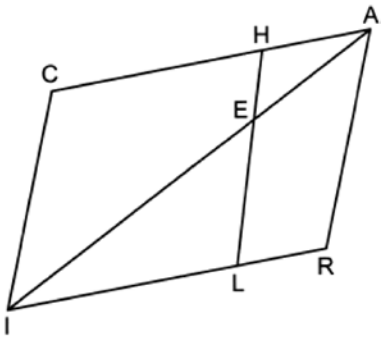


76 Quadrilateral *READ* has vertices with coordinates $R(-1,3)$, $E(2,7)$, $A(10,1)$, and $D(7,-3)$. Prove *READ* is a rectangle. [The use of the set of axes below is optional.]



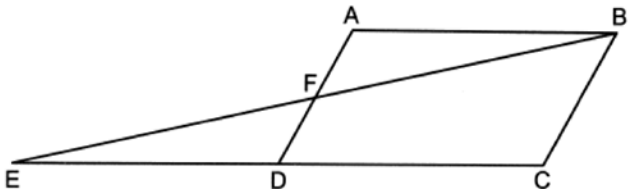
Geometry 6 Point Regents Exam Questions

77 Given: Quadrilateral $CARI$ with $\overline{CA} \cong \overline{RI}$ and $\overline{CI} \cong \overline{RA}$, and $\overline{AEI}$ and $\overline{LEH}$ are drawn



Prove: $HA \bullet EL = LI \bullet EH$

78 In quadrilateral $ABCD$ below, side $\overline{CD}$ is extended through D to point E such that $\overline{AFD}$ and $\overline{BFE}$ bisect each other, and $\overline{DE} \cong \overline{DC}$.



Prove $ABCD$ is a parallelogram.

Geometry Multiple Choice Regents Exam Questions
Answer Section

1 ANS: 1
$m = 4$

PTS: 2 REF: 062513geo TOP: Parallel and Perpendicular Lines
KEY: write equation of parallel line

2 ANS: 1
$4x - 6y = 24$

$-6y = -4x + 24$

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

PTS: 2 REF: 082521geo TOP: Line Dilations

3 ANS: 3
The slope of line h is $\frac{2}{3}$. The perpendicular slope is $-\frac{3}{2}$.

PTS: 2 REF: 082512geo TOP: Parallel and Perpendicular Lines
KEY: write equation of perpendicular line

4 ANS: 4
$x^2 - 6x + 9 + y^2 + 2y + 1 = 14 + 9 + 1$

$(x-3)^2 + (y+1)^2 = 24$

PTS: 2 REF: 062506geo TOP: Equations of Circles
KEY: completing the square

5 ANS: 3 PTS: 2 REF: 062501geo TOP: Dilations

6 ANS: 3
$\tan 70.19 = \frac{h}{200}$

$h \approx 555$

PTS: 2 REF: 062502geo TOP: Using Trigonometry to Find a Side

7 ANS: 2
$\frac{360°}{8} = 45°$ 90º is a multiple of 45º

PTS: 2 REF: 062505geo TOP: Mapping a Polygon onto Itself

8 ANS: 3 PTS: 2 REF: 082509geo TOP: Identifying Transformations
KEY: graphics

9 ANS: 4 PTS: 2 REF: 062516geo TOP: Special Quadrilaterals

10 ANS: 4 PTS: 2 REF: 062514geo
TOP: Cross-Sections of Three-Dimensional Objects

11 ANS: 2

$\cos 38 = \frac{x}{31.8}$

$x \approx 25.1$

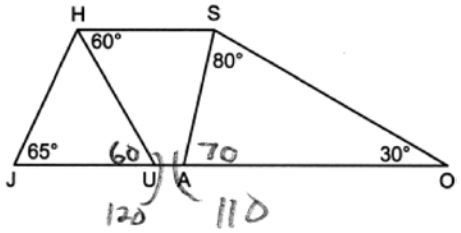
PTS: 2 REF: 082503geo TOP: Using Trigonometry to Find a Side

12 ANS: 2

$x_0 = \frac{kx_1 - x_2}{k-1} = \frac{2(3)-4}{2-1} = 2 \quad y_0 = \frac{ky_1 - y_2}{k-1} = \frac{2(3)-5}{2-1} = 1$

PTS: 2 REF: 082517geo TOP: Dilations

13 ANS: 4



PTS: 2 REF: 082506geo TOP: Interior and Exterior Angles of Polygons

14 ANS: 4 PTS: 2 REF: 082519geo TOP: Similarity
KEY: basic

15 ANS: 4 PTS: 2 REF: 062512geo TOP: Identifying Transformations

16 ANS: 4

$75.4 = \frac{1}{3}\pi r^2(8)$

$r \approx 3$

PTS: 2 REF: 062523geo TOP: Volume KEY: cones

17 ANS: 2

$\frac{x}{20} = \frac{15}{25}$

$25x = 300$

$x = 12$

PTS: 2 REF: 082523geo TOP: Similarity

18 ANS: 3

$\frac{\frac{360-68}{2} - 68}{2} = 39$

PTS: 2 REF: 062510geo TOP: Chords, Secants and Tangents
KEY: secant and tangent drawn from common point, angle

19 ANS: 2 PTS: 2 REF: spr2401geo TOP: Identifying Transformations

20 ANS: 2 PTS: 2 REF: 062522geo TOP: Identifying Transformations

21 ANS: 1
$5(2) - 2(0) = 10$

PTS: 2 REF: 062524geo TOP: Line Dilations
22 ANS: 1 PTS: 2 REF: 062503geo TOP: Compositions of Transformations
23 ANS: 2
$2 + 7 > 8$

PTS: 2 REF: 062504geo TOP: Triangle Inequality Theorem
24 ANS: 3
$K = \frac{1}{2}(8)(9)\sin 55 \approx 29$

PTS: 2 REF: 082516geo TOP: Using Trigonometry to Find Area
KEY: basic
25 ANS: 2
$\frac{8}{12} = \frac{11}{x}$

$8x = 132$

$x = 16.5$

PTS: 2 REF: 062515geo TOP: Side Splitter Theorem
26 ANS: 1
$\frac{1}{2}(7)(12)\sin(33) \approx 22.9$

PTS: 2 REF: 062511geo TOP: Using Trigonometry to Find Area
KEY: basic
27 ANS: 3
$V = \frac{1}{2} \times \frac{4}{3}\pi \cdot (8)^3 \approx 1072$

PTS: 2 REF: 082504geo TOP: Volume KEY: spheres
28 ANS: 3
$\frac{\frac{1}{3}(6^2)(10)}{3.5} \approx 34.3$

PTS: 2 REF: 062509geo TOP: Volume KEY: pyramids
29 ANS: 4
$-2 + \frac{1}{5}(3 - -2) = -2 + \frac{1}{5}(5) = -2 + 1 = -1 \quad -9 + \frac{1}{5}(6 - -9) = -9 + \frac{1}{5}(15) = -9 + 3 = -6$

PTS: 2 REF: 062517geo TOP: Directed Line Segments

30 ANS: 3

$x^2 = 2.5 \times (2.5 + 4.3)$

$x \approx 4.1$

PTS: 2 REF: 062519geo TOP: Similarity

31 ANS: 1 PTS: 2 REF: 082522geo TOP: Mapping a Polygon onto Itself

32 ANS: 1

$180 - 141 = 39$

PTS: 2 REF: 062520geo TOP: Trapezoids

33 ANS: 2

$K = \frac{1}{2}(8)(5)\sin 57 \approx 16.8$

PTS: 2 REF: spr2403geo TOP: Using Trigonometry to Find Area

KEY: basic

34 ANS: 3

$x^2 + x^2 = (10\sqrt{2})^2$

$2x^2 = 200$

$x^2 = 100$

$x = 10$

PTS: 2 REF: 082515geo TOP: Special Right Triangles

35 ANS: 3

$\cos F = \frac{23}{30}$

$F \approx 40°$

PTS: 2 REF: 062507geo TOP: Using Trigonometry to Find an Angle

36 ANS: 2

$\frac{14}{2} + 9 + \frac{14}{2} + 9 = 32$

PTS: 2 REF: 062508geo TOP: Midsegments

37 ANS: 2

$3x - 5 = 2(x + 3)$

$3x - 5 = 2x + 6$

$x = 11$

PTS: 2 REF: 082514geo TOP: Midsegments

38 ANS: 1 PTS: 2 REF: 082501geo TOP: Rotations of Two-Dimensional Objects

39 ANS: 2 PTS: 2 REF: 062521geo TOP: Properties of Transformations

40 ANS: 2

$$\frac{10 \cdot 4 \cdot \frac{1}{3}}{0.6} \approx 22.2$$

PTS: 2 REF: 082520geo TOP: Volume KEY: prisms

41 ANS: 2

$$\frac{4}{6} = \frac{12}{x}$$

$$4x = 72$$

$$x = 18$$

PTS: 2 REF: 082507geo TOP: Side Splitter Theorem

42 ANS: 4

$$4 + 8 + \sqrt{4^2 + 8^2} = 12 + \sqrt{80} = 12 + 4\sqrt{5}$$

PTS: 2 REF: 082518geo TOP: Polygons in the Coordinate Plane

43 ANS: 4 PTS: 2 REF: spr2404geo TOP: Equations of Circles
KEY: write equation, given graph

44 ANS: 3

$$17x = 22 \cdot 10$$

$$x \approx 12.9$$

PTS: 2 REF: 082510geo TOP: Chords, Secants and Tangents
KEY: secants drawn from common point, length

45 ANS: 4 PTS: 2 REF: 082511geo TOP: Interior and Exterior Angles of Triangles

46 ANS: 3

$$\frac{6\sqrt{3}}{x} = \frac{\sqrt{3}}{2}$$

$$x = 12$$

PTS: 2 REF: spr2402geo TOP: Special Right Triangles

47 ANS: 1

$$\frac{4}{3}\pi\left(\frac{1.7}{2}\right)^3 \times .8 \approx 2.06$$

PTS: 2 REF: 062518geo TOP: Volume KEY: spheres

48 ANS: 1

$$\frac{1}{3}(8.2)^2(17.4)(0.77) \approx 300$$

PTS: 2 REF: 082513geo TOP: Density

49 ANS: 4 PTS: 2 REF: 082505geo TOP: Special Quadrilaterals

50 ANS: 1

$$\left(\frac{\sqrt{36}}{2}\right)^2 = 9$$

PTS: 2 REF: 082524geo TOP: Similarity KEY: perimeter and area
51 ANS: 3 PTS: 2 REF: 082502geo TOP: Properties of Transformations
52 ANS: 1 PTS: 2 REF: 082508geo TOP: Equations of Circles
KEY: write equation, given graph

Geometry 2 Point Regents Exam Questions
Answer Section

53 ANS:

$\frac{982.5}{5^3} = 7.86$ Iron

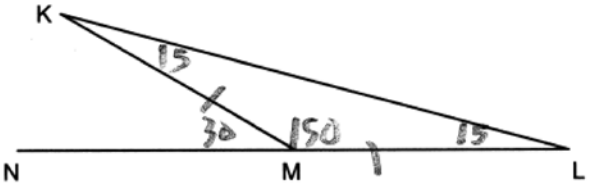
PTS: 2 REF: 082526geo TOP: Density

54 ANS:

Lancaster $\frac{10087}{2.7} > \frac{15069}{5.1}$

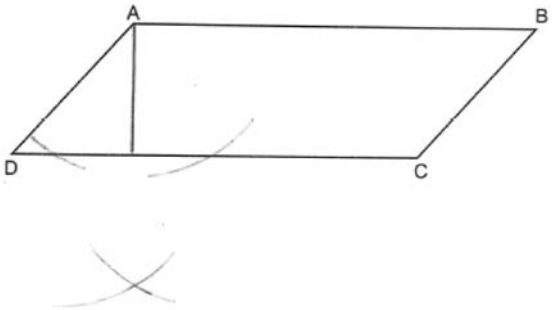
PTS: 2 REF: 062525geo TOP: Density

55 ANS:



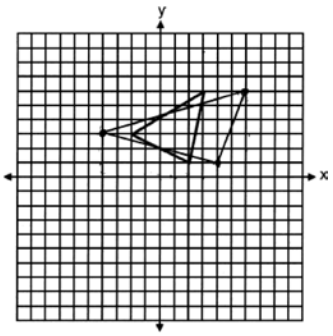
PTS: 2 REF: 082529geo TOP: Exterior Angle Theorem

56 ANS:



PTS: 2 REF: 062527geo TOP: Constructions
KEY: parallel and perpendicular lines

57 ANS:



PTS: 2 REF: spr2405geo TOP: Analytical Representations of Transformations
KEY: graphics

58 ANS:
Translations preserve distance.

PTS: 2 REF: 082525geo TOP: Properties of Transformations

59 ANS:

$$\sin 4.8 = \frac{.6}{x}$$

$$x \approx 7.2$$

PTS: 2 REF: 082528geo TOP: Using Trigonometry to Find a Side

60 ANS:

$$\frac{7.5\pi}{25\pi} \cdot 360 = 108$$

PTS: 2 REF: 082530geo TOP: Sectors

61 ANS:

$$40\pi\left(\frac{36}{360}\right) = 4\pi$$

PTS: 2 REF: 062530geo TOP: Arc Length

62 ANS:

$3x - 22 + 4x - 18 = 6x - 23$ $180 - (6(17) - 23) = 180 - (102 - 23) = 180 - 79 = 101$

$$7x - 40 = 6x - 23$$

$$x = 17$$

PTS: 2 REF: 062526geo TOP: Exterior Angle Theorem

63 ANS:

PTS: 2 REF: 082531geo TOP: Constructions
KEY: line bisector

64 ANS:

$-3 + \frac{3}{5}(7 - -3) = -3 + \frac{3}{5}(10) = -3 + 6 = 3$ $1 + \frac{3}{5}(6 - 1) = 1 + \frac{3}{5}(5) = 1 + 3 = 4$ $(3,4)$

PTS: 2 REF: 082527geo TOP: Directed Line Segments

65 ANS:

$\frac{5.6}{6} = \frac{8.4}{9} \rightarrow 50.4 = 50.4$ $\frac{4}{6} = \frac{6}{9} \rightarrow 36 = 36$ $\frac{4}{5.6} = \frac{6}{8.4} \rightarrow 33.6 = 33.6$ The corresponding sides are proportional.

PTS: 2 REF: 062531geo TOP: Similarity KEY: basic

66 ANS:

$3x - 7 + x + 1 = 90$

$4x - 6 = 90$

$4x = 96$

$x = 24$

PTS: 2 REF: 062529geo TOP: Cofunctions

67 ANS:

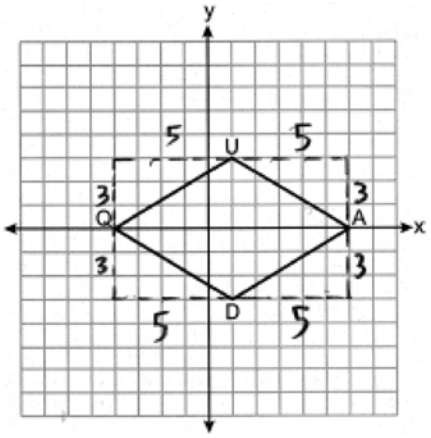
$4\sqrt{3^2 + 3^2} + 2(2) = 4\sqrt{18} + 4 = 12\sqrt{2} + 4$

PTS: 2 REF: spr2408geo TOP: Polygons in the Coordinate Plane

68 ANS:

PTS: 2 REF: spr2406geo TOP: Constructions
KEY: line bisector

69 ANS:



$(10 \times 6) - 4\left(\frac{1}{2}(5)(3)\right) = 60 - 30 = 30$

PTS: 2 REF: 062528geo TOP: Polygons in the Coordinate Plane

Geometry 4 Point Regents Exam Questions
Answer Section

70 ANS:

$\sin 24 = \frac{4}{x}$. $\sin 11.6 = \frac{3}{y}$ No, because $9.8 + 14.9 > 20$.

$x \approx 9.8$ $y \approx 14.9$

PTS: 4 REF: 062534geo TOP: Using Trigonometry to Find a Side

71 ANS:

$\frac{4}{x+3} = \frac{x-1}{15}$ $7 + 3 = 10$

$x^2 - x + 3x - 3 = 60$

$x^2 + 2x - 63 = 0$

$(x+9)(x-7) = 0$

$x = 7$

PTS: 4 REF: spr2407geo TOP: Similarity KEY: basic

72 ANS:

$\frac{75000}{\pi(10)^2(26)} \approx 9$

PTS: 4 REF: 082532geo TOP: Volume KEY: cylinders

73 ANS:

The cone: 1) $4 \times 4 \times 7.5 = 120$; 2) $\pi(2.5)^2(6) \approx 118$; 3) $\frac{1}{3}\pi(3.75)^2(8.5) \approx 125$

PTS: 4 REF: 062532geo TOP: Volume KEY: cones

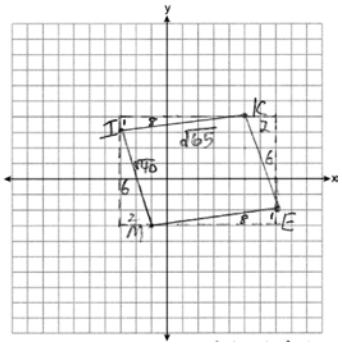
74 ANS:

$\tan 50 = \frac{12}{x}$ $10 + 3 = 13$ $\tan\theta = \frac{12}{13}$

$x \approx 10$ $\theta \approx 43$

PTS: 4 REF: 082533geo TOP: Using Trigonometry to Find an Angle

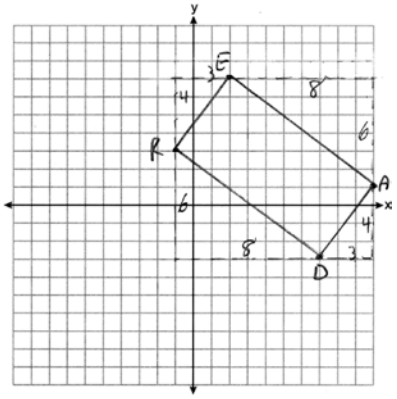
75 ANS:



$m_{\overline{MI}} = \frac{-3-3}{-1--3} = \frac{-6}{2} = -3$; $m_{\overline{KE}} = \frac{4--2}{5-7} = \frac{6}{-2} = -3$; $m_{\overline{IK}} = \frac{4-3}{5--3} = \frac{1}{8}$; $m_{\overline{ME}} = \frac{-2--3}{7--1} = \frac{1}{8}$. Because opposite side of Quadrilateral *MIKE* have the same slope, the sides are parallel. The opposite sides of a parallelogram are parallel, so *MIKE* is a parallelogram. $MI = \sqrt{6^2 + 2^2} = \sqrt{40}$; $IK = \sqrt{8^2 + 1^2} = \sqrt{65}$. Because two sides of Quadrilateral *MIKE* have different lengths, they are not congruent. All the sides of a rhombus are congruent, so *MIKE* is not a rhombus.

PTS: 4 REF: 062533geo TOP: Quadrilaterals in the Coordinate Plane

76 ANS:



$m_{\overline{RE}} = \frac{4}{3}$ $m_{\overline{EA}} = -\frac{6}{8} = -\frac{3}{4}$ $m_{\overline{AD}} = \frac{4}{3}$ $m_{\overline{DR}} = -\frac{6}{8} = -\frac{3}{4}$ Adjacent sides have slopes that are opposite reciprocals, so are perpendicular. Perpendicular lines form right angles. A quadrilateral with four right angles is a rectangle.

PTS: 4 REF: 082534geo TOP: Quadrilaterals in the Coordinate Plane

Geometry 6 Point Regents Exam Questions
Answer Section

77 ANS:
1) Quadrilateral $CARI$ with $\overline{CA} \cong \overline{RI}$ and $\overline{CI} \cong \overline{RA}$, and $\overline{AEI}$ and $\overline{LEH}$ are drawn (Given); 2) Quadrilateral $CARI$ is a parallelogram (Opposite sides of a parallelogram are congruent); 3) $\overline{CA} \parallel \overline{RI}$ and $\overline{CI} \parallel \overline{RA}$ (Opposite sides of a parallelogram are parallel); 4) $\angle AHE \cong \angle ILE$ and $\angle HAE \cong \angle LIE$ (Parallel lines cut by a transversal create congruent alternate interior angles); 5) $\triangle HAE \sim \triangle LIE$ (AA); 6) $\frac{HA}{EH} = \frac{LI}{EL}$ (Corresponding sides of similar triangles are proportional); 7) $HA \bullet EL = LI \bullet EH$ (The product of the means equals the product of the extremes).

PTS: 6 REF: 062535geo TOP: Quadrilateral Proofs

78 ANS:
1) Quadrilateral $ABCD$, side $\overline{CD}$ is extended through D to point E such that $\overline{AFD}$ and $\overline{BFE}$ bisect each other, and $\overline{DE} \cong \overline{DC}$ (given); 2) $\overline{FE} \cong \overline{FB}$ and $\overline{FD} \cong \overline{FA}$ (bisected lines form two congruent segments); 3) $\angle EFD \cong \angle BFA$ (vertical angles are congruent); 4) $\triangle EFD \cong \triangle BFA$ (SAS); 5) $\overline{AB} \cong \overline{DE}, \angle E \cong \angle ABF$ (CPCTC); 6) $\overline{AB} \cong \overline{DC}$ (Substitution); 7) $\overline{AB} \parallel \overline{DC}$ (if the alternate interior angles formed by a transversal crossing two lines are congruent, the lines are parallel); 8) $ABCD$ is a parallelogram (if a pair of opposite sides of a quadrilateral are parallel and congruent, it is a parallelogram).

PTS: 6 REF: 082535geo TOP: Quadrilateral Proofs