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REGENTS BY TYPE

The NY Geometry Regents Exam Questions
from Spring 2014 to January 2018 Sorted by Type

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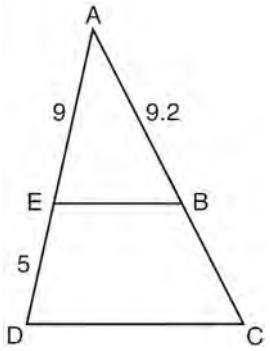
Geometry Common Core State Standards Multiple Choice Regents Exam Questions

1 A gallon of paint will cover approximately 450 square feet. An artist wants to paint all the outside surfaces of a cube measuring 12 feet on each edge. What is the *least* number of gallons of paint he must buy to paint the cube?
1) 1
2) 2
3) 3
4) 4

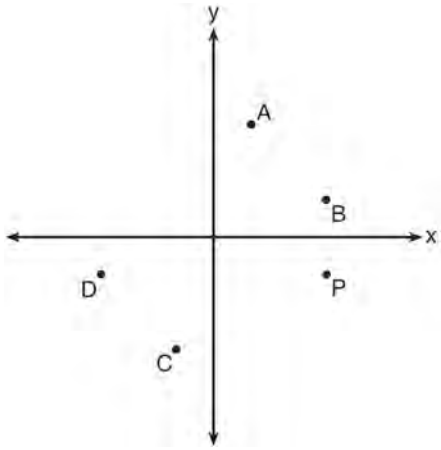
2 In the diagram of $\triangle ADC$ below, $\overline{EB} \parallel \overline{DC}$, $AE = 9$, $ED = 5$, and $AB = 9.2$.



What is the length of $\overline{AC}$, to the *nearest tenth*?
1) 5.1
2) 5.2
3) 14.3
4) 14.4

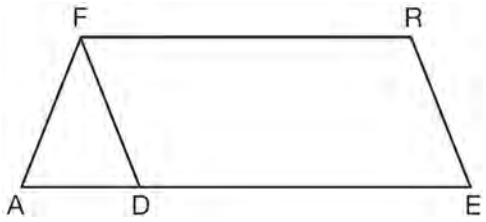
3 Which expression is always equivalent to $\sin x$ when $0° < x < 90°$?
1) $\cos(90° - x)$
2) $\cos(45° - x)$
3) $\cos(2x)$
4) $\cos x$

4 Which point shown in the graph below is the image of point *P* after a counterclockwise rotation of 90° about the origin?



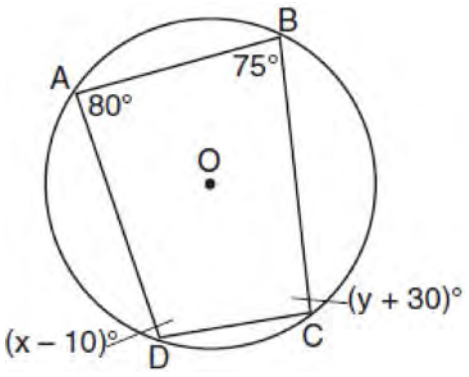
1) *A*
2) *B*
3) *C*
4) *D*

5 In the diagram of parallelogram *FRED* shown below, $\overline{ED}$ is extended to *A*, and $\overline{AF}$ is drawn such that $\overline{AF} \cong \overline{DF}$.



If $m\angle R = 124°$, what is $m\angle AFD$?
1) 124°
2) 112°
3) 68°
4) 56°

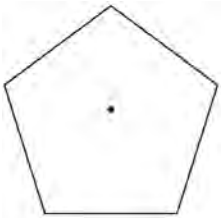
6 Quadrilateral *ABCD* is inscribed in circle *O*, as shown below.



If $m\angle A = 80°$, $m\angle B = 75°$, $m\angle C = (y + 30)°$, and $m\angle D = (x - 10)°$, which statement is true?

1) $x = 85$ and $y = 50$
2) $x = 90$ and $y = 45$
3) $x = 110$ and $y = 75$
4) $x = 115$ and $y = 70$

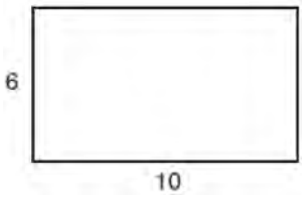
7 A regular pentagon is shown in the diagram below.



If the pentagon is rotated clockwise around its center, the minimum number of degrees it must be rotated to carry the pentagon onto itself is

1) 54°
2) 72°
3) 108°
4) 360°

8 A rectangle whose length and width are 10 and 6, respectively, is shown below. The rectangle is continuously rotated around a straight line to form an object whose volume is 150π.



Which line could the rectangle be rotated around?

1) a long side
2) a short side
3) the vertical line of symmetry
4) the horizontal line of symmetry

9 Seawater contains approximately 1.2 ounces of salt per liter on average. How many gallons of seawater, to the *nearest tenth of a gallon*, would contain 1 pound of salt?

1) 3.3
2) 3.5
3) 4.7
4) 13.3

10 The line $y = 2x - 4$ is dilated by a scale factor of $\frac{3}{2}$ and centered at the origin. Which equation represents the image of the line after the dilation?

1) $y = 2x - 4$
2) $y = 2x - 6$
3) $y = 3x - 4$
4) $y = 3x - 6$

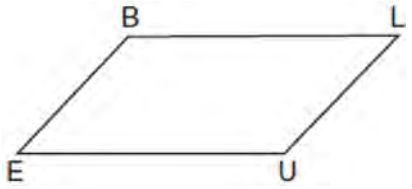
11 A line segment is dilated by a scale factor of 2 centered at a point not on the line segment. Which statement regarding the relationship between the given line segment and its image is true?
1) The line segments are perpendicular, and the image is one-half of the length of the given line segment.
2) The line segments are perpendicular, and the image is twice the length of the given line segment.
3) The line segments are parallel, and the image is twice the length of the given line segment.
4) The line segments are parallel, and the image is one-half of the length of the given line segment.

12 Rectangle *A'B'C'D'* is the image of rectangle *ABCD* after a dilation centered at point *A* by a scale factor of $\frac{2}{3}$. Which statement is correct?
1) Rectangle *A'B'C'D'* has a perimeter that is $\frac{2}{3}$ the perimeter of rectangle *ABCD*.
2) Rectangle *A'B'C'D'* has a perimeter that is $\frac{3}{2}$ the perimeter of rectangle *ABCD*.
3) Rectangle *A'B'C'D'* has an area that is $\frac{2}{3}$ the area of rectangle *ABCD*.
4) Rectangle *A'B'C'D'* has an area that is $\frac{3}{2}$ the area of rectangle *ABCD*.

13 Given $\triangle ABC \cong \triangle DEF$, which statement is *not* always true?
1) $\overline{BC} \cong \overline{DF}$
2) $m\angle A = m\angle D$
3) area of $\triangle ABC$ = area of $\triangle DEF$
4) perimeter of $\triangle ABC$ = perimeter of $\triangle DEF$

14 The image of $\triangle DEF$ is $\triangle D'E'F'$. Under which transformation will he triangles *not* be congruent?
1) a reflection through the origin
2) a reflection over the line $y = x$
3) a dilation with a scale factor of 1 centered at $(2,3)$
4) a dilation with a scale factor of $\frac{3}{2}$ centered at the origin

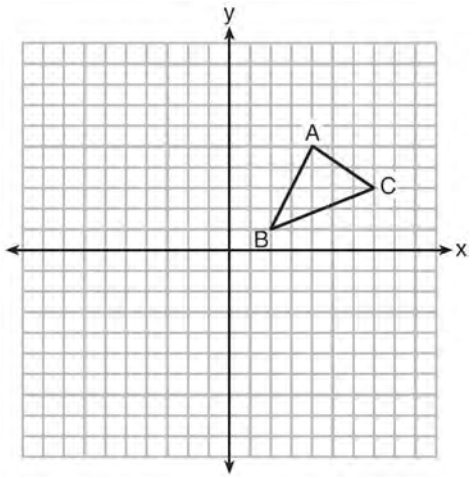
15 In quadrilateral *BLUE* shown below, $\overline{BE} \cong \overline{UL}$.



Which information would be sufficient to prove quadrilateral *BLUE* is a parallelogram?
1) $\overline{BL} \parallel \overline{EU}$
2) $\overline{LU} \parallel \overline{BE}$
3) $\overline{BE} \cong \overline{BL}$
4) $\overline{LU} \cong \overline{EU}$

16 A parallelogram is always a rectangle if
1) the diagonals are congruent
2) the diagonals bisect each other
3) the diagonals intersect at right angles
4) the opposite angles are congruent

17 In the diagram below, $\triangle ABC$ has vertices $A(4,5)$, $B(2,1)$, and $C(7,3)$.



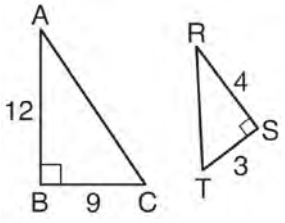
What is the slope of the altitude drawn from A to $\overline{BC}$?

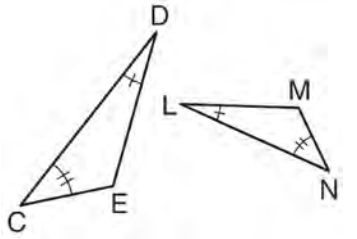
1) $\frac{2}{5}$
2) $\frac{3}{2}$
3) $-\frac{1}{2}$
4) $-\frac{5}{2}$

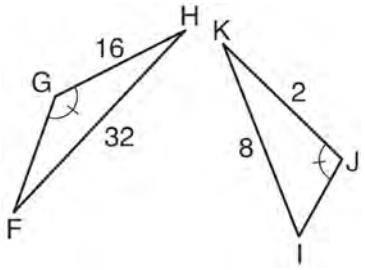
18 A line that passes through the points whose coordinates are $(1,1)$ and $(5,7)$ is dilated by a scale factor of 3 and centered at the origin. The image of the line

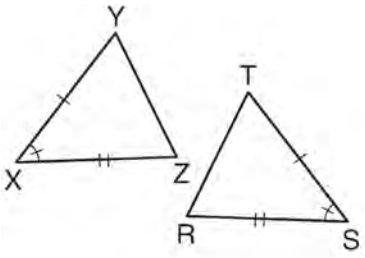
1) is perpendicular to the original line
2) is parallel to the original line
3) passes through the origin
4) is the original line

19 Using the information given below, which set of triangles can *not* be proven similar?

1) 

2) 

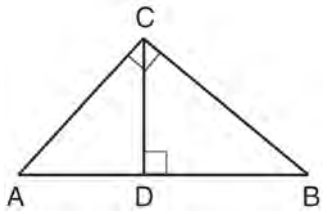
3) 

4) 

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

1) center $(-3,1)$ and radius 4
2) center $(3,-1)$ and radius 4
3) center $(-3,1)$ and radius 16
4) center $(3,-1)$ and radius 16

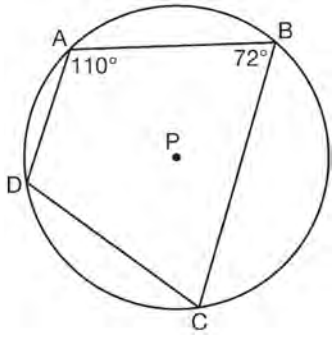
21 In the diagram below, $\overline{CD}$ is the altitude drawn to the hypotenuse $\overline{AB}$ of right triangle ABC.



Which lengths would *not* produce an altitude that measures $6\sqrt{2}$?

1) $AD = 2$ and $DB = 36$
2) $AD = 3$ and $AB = 24$
3) $AD = 6$ and $DB = 12$
4) $AD = 8$ and $AB = 17$

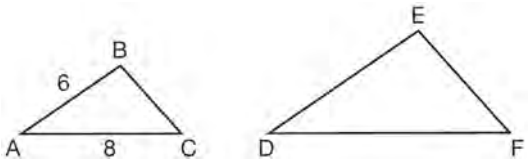
22 In the diagram below, quadrilateral $ABCD$ is inscribed in circle P.



What is $m\angle ADC$?

1) 70°
2) 72°
3) 108°
4) 110°

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



If $AB = 6$ and $AC = 8$, which statement will justify similarity by SAS?

1) $DE = 9$, $DF = 12$, and $\angle A \cong \angle D$
2) $DE = 8$, $DF = 10$, and $\angle A \cong \angle D$
3) $DE = 36$, $DF = 64$, and $\angle C \cong \angle F$
4) $DE = 15$, $DF = 20$, and $\angle C \cong \angle F$

24 In $\triangle ABC$, where $\angle C$ is a right angle, $\cos A = \frac{\sqrt{21}}{5}$. What is $\sin B$?

1) $\frac{\sqrt{21}}{5}$
2) $\frac{\sqrt{21}}{2}$
3) $\frac{2}{5}$
4) $\frac{5}{\sqrt{21}}$

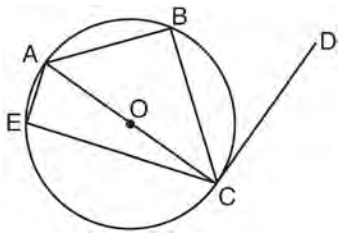
25 In parallelogram $ABCD$, diagonals $\overline{AC}$ and $\overline{BD}$ intersect at E. Which statement does *not* prove parallelogram $ABCD$ is a rhombus?

1) $\overline{AC} \cong \overline{DB}$
2) $\overline{AB} \cong \overline{BC}$
3) $\overline{AC} \perp \overline{DB}$
4) $\overline{AC}$ bisects $\angle DCB$

26 In circle O, secants $\overline{ADB}$ and $\overline{AEC}$ are drawn from external point A such that points D, B, E, and C are on circle O. If $AD = 8$, $AE = 6$, and EC is 12 more than BD, the length of $\overline{BD}$ is
1) 6
2) 22
3) 36
4) 48

27 In $\triangle ABC$, the complement of $\angle B$ is $\angle A$. Which statement is always true?
1) $\tan\angle A = \tan\angle B$
2) $\sin\angle A = \sin\angle B$
3) $\cos\angle A = \tan\angle B$
4) $\sin\angle A = \cos\angle B$

28 In circle O shown below, diameter $\overline{AC}$ is perpendicular to $\overline{CD}$ at point C, and chords $\overline{AB}$, $\overline{BC}$, $\overline{AE}$, and $\overline{CE}$ are drawn.



Which statement is *not* always true?
1) $\angle ACB \cong \angle BCD$
2) $\angle ABC \cong \angle ACD$
3) $\angle BAC \cong \angle DCB$
4) $\angle CBA \cong \angle AEC$

29 If $x^2 + 4x + y^2 - 6y - 12 = 0$ is the equation of a circle, the length of the radius is
1) 25
2) 16
3) 5
4) 4

30 Molly wishes to make a lawn ornament in the form of a solid sphere. The clay being used to make the sphere weighs .075 pound per cubic inch. If the sphere's radius is 4 inches, what is the weight of the sphere, to the *nearest pound*?
1) 34
2) 20
3) 15
4) 4

31 Line segment NY has endpoints $N(-11,5)$ and $Y(5,-7)$. What is the equation of the perpendicular bisector of $\overline{NY}$?
1) $y + 1 = \frac{4}{3}(x + 3)$
2) $y + 1 = -\frac{3}{4}(x + 3)$
3) $y - 6 = \frac{4}{3}(x - 8)$
4) $y - 6 = -\frac{3}{4}(x - 8)$

32 Which transformation would *not* carry a square onto itself?
1) a reflection over one of its diagonals
2) a 90° rotation clockwise about its center
3) a 180° rotation about one of its vertices
4) a reflection over the perpendicular bisector of one side

33 Which set of statements would describe a parallelogram that can always be classified as a rhombus?

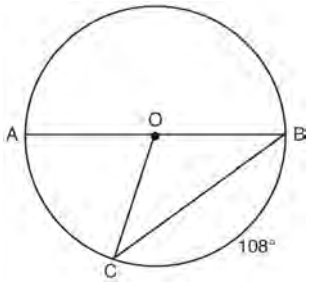
I. Diagonals are perpendicular bisectors of each other.

II. Diagonals bisect the angles from which they are drawn.

III. Diagonals form four congruent isosceles right triangles.

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

34 In circle *O*, diameter $\overline{AB}$, chord $\overline{BC}$, and radius $\overline{OC}$ are drawn, and the measure of arc *BC* is 108°.



Some students wrote these formulas to find the area of sector *COB*:

Amy $\frac{3}{10} \cdot \pi \cdot (BC)^2$

Beth $\frac{108}{360} \cdot \pi \cdot (OC)^2$

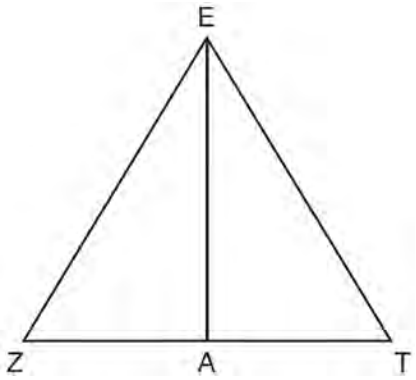
Carl $\frac{3}{10} \cdot \pi \cdot (\frac{1}{2} AB)^2$

Dex $\frac{108}{360} \cdot \pi \cdot \frac{1}{2} (AB)^2$

Which students wrote correct formulas?

1) Amy and Dex
2) Beth and Carl
3) Carl and Amy
4) Dex and Beth

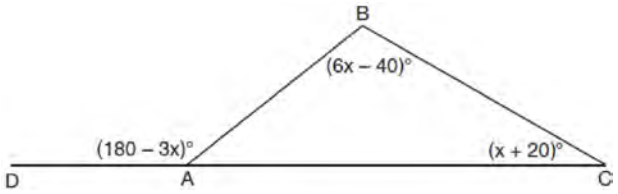
35 Line segment *EA* is the perpendicular bisector of $\overline{ZT}$, and $\overline{ZE}$ and $\overline{TE}$ are drawn.



Which conclusion can *not* be proven?

1) $\overline{EA}$ bisects angle *ZET*.
2) Triangle *EZT* is equilateral.
3) $\overline{EA}$ is a median of triangle *EZT*.
4) Angle *Z* is congruent to angle *T*.

36 In $\triangle ABC$ shown below, side $\overline{AC}$ is extended to point *D* with $m\angle DAB = (180 - 3x)°$, $m\angle B = (6x - 40)°$, and $m\angle C = (x + 20)°$.



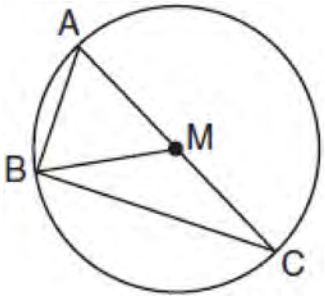
What is $m\angle BAC$?

1) 20°
2) 40°
3) 60°
4) 80°

37 A parallelogram must be a rhombus if its diagonals
1) are congruent
2) bisect each other
3) do not bisect its angles
4) are perpendicular to each other

38 What is an equation of a line that is perpendicular to the line whose equation is $2y = 3x - 10$ and passes through $(-6, 1)$?
1) $y = -\frac{2}{3}x - 5$
2) $y = -\frac{2}{3}x - 3$
3) $y = \frac{2}{3}x + 1$
4) $y = \frac{2}{3}x + 10$

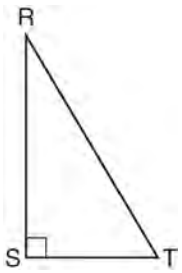
39 In circle M below, diameter $\overline{AC}$, chords $\overline{AB}$ and $\overline{BC}$, and radius $\overline{MB}$ are drawn.



Which statement is *not* true?
1) $\triangle ABC$ is a right triangle.
2) $\triangle ABM$ is isosceles.
3) $\text{m}\overset{\frown}{BC} = \text{m}\angle BMC$
4) $\text{m}\overset{\frown}{AB} = \frac{1}{2}\text{m}\angle ACB$

40 A circle whose center is the origin passes through the point $(-5, 12)$. Which point also lies on this circle?
1) $(10, 3)$
2) $(-12, 13)$
3) $(11, 2\sqrt{12})$
4) $(-8, 5\sqrt{21})$

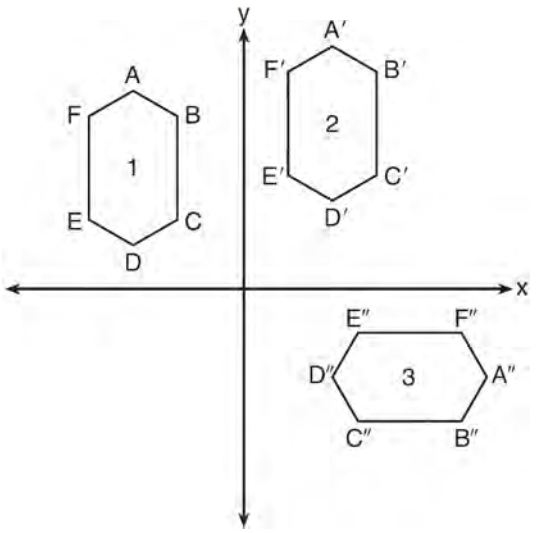
41 Which object is formed when right triangle RST shown below is rotated around leg $\overline{RS}$?



1) a pyramid with a square base
2) an isosceles triangle
3) a right triangle
4) a cone

42 A water cup in the shape of a cone has a height of 4 inches and a maximum diameter of 3 inches. What is the volume of the water in the cup, to the *nearest tenth of a cubic inch*, when the cup is filled to half its height?
1) 1.2
2) 3.5
3) 4.7
4) 14.1

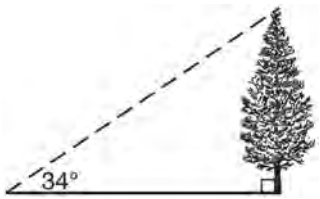
43 In the diagram below, congruent figures 1, 2, and 3 are drawn.



Which sequence of transformations maps figure 1 onto figure 2 and then figure 2 onto figure 3?

1) a reflection followed by a translation
2) a rotation followed by a translation
3) a translation followed by a reflection
4) a translation followed by a rotation

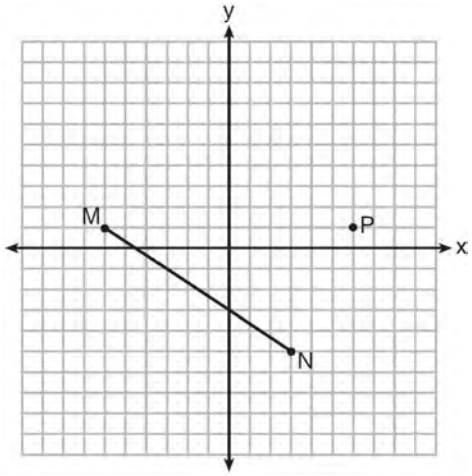
44 As shown in the diagram below, the angle of elevation from a point on the ground to the top of the tree is 34°.



If the point is 20 feet from the base of the tree, what is the height of the tree, to the *nearest tenth of a foot*?

1) 29.7
2) 16.6
3) 13.5
4) 11.2

45 Given $\overline{MN}$ shown below, with $M(-6,1)$ and $N(3,-5)$, what is an equation of the line that passes through point $P(6,1)$ and is parallel to $\overline{MN}$?



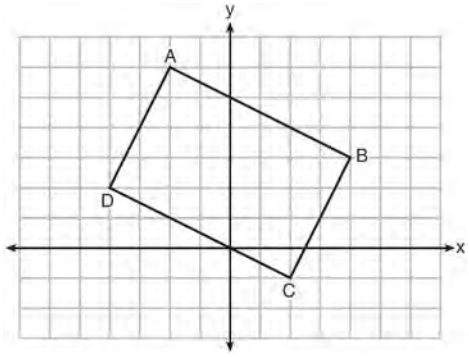
1) $y = -\frac{2}{3}x + 5$
2) $y = -\frac{2}{3}x - 3$
3) $y = \frac{3}{2}x + 7$
4) $y = \frac{3}{2}x - 8$

46 The diagonals of rhombus *TEAM* intersect at $P(2,1)$. If the equation of the line that contains diagonal $\overline{TA}$ is $y = -x + 3$, what is the equation of a line that contains diagonal *EM*?

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

47 Which rotation about its center will carry a regular decagon onto itself?
1) 54°
2) 162°
3) 198°
4) 252°

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

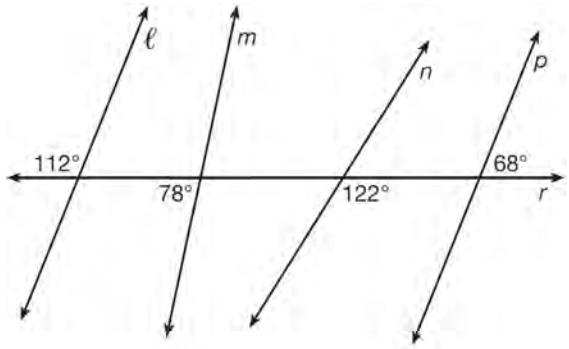


When *ABCD* is rotated 90° in a counterclockwise direction about the origin, its image is quadrilateral *A'B'C'D'*. Is distance preserved under this rotation, and which coordinates are correct for the given vertex?
1) no and $C'(1,2)$
2) no and $D'(2,4)$
3) yes and $A'(6,2)$
4) yes and $B'(-3,4)$

49 Line segment $A'B'$, whose endpoints are $(4,-2)$ and $(16,14)$, is the image of $\overline{AB}$ after a dilation of $\frac{1}{2}$ centered at the origin. What is the length of $\overline{AB}$?
1) 5
2) 10
3) 20
4) 40

50 The equation of a circle is $x^2 + y^2 + 6y = 7$. What are the coordinates of the center and the length of the radius of the circle?
1) center $(0,3)$ and radius 4
2) center $(0,-3)$ and radius 4
3) center $(0,3)$ and radius 16
4) center $(0,-3)$ and radius 16

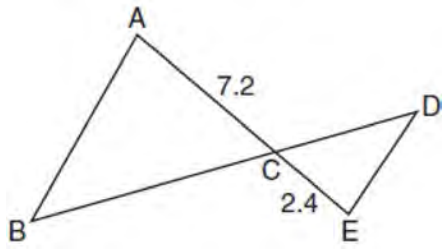
51 In the diagram below, lines ℓ, *m*, *n*, and *p* intersect line *r*.



Which statement is true?
1) $\ell \parallel n$
2) $\ell \parallel p$
3) $m \parallel p$
4) $m \parallel n$

52 A man who is 5 feet 9 inches tall casts a shadow of 8 feet 6 inches. Assuming that the man is standing perpendicular to the ground, what is the angle of elevation from the end of the shadow to the top of the man's head, to the *nearest tenth of a degree*?
1) 34.1
2) 34.5
3) 42.6
4) 55.9

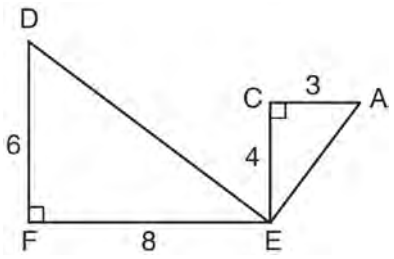
53 In the diagram below, $AC = 7.2$ and $CE = 2.4$.



Which statement is *not* sufficient to prove $\triangle ABC \sim \triangle EDC$?

1) $\overline{AB} \parallel \overline{ED}$
2) $DE = 2.7$ and $AB = 8.1$
3) $CD = 3.6$ and $BC = 10.8$
4) $DE = 3.0$, $AB = 9.0$, $CD = 2.9$, and $BC = 8.7$

54 Given: $\triangle AEC$, $\triangle DEF$, and $\overline{FE} \perp \overline{CE}$



What is a correct sequence of similarity transformations that shows $\triangle AEC \sim \triangle DEF$?

1) a rotation of 180 degrees about point E followed by a horizontal translation
2) a counterclockwise rotation of 90 degrees about point E followed by a horizontal translation
3) a rotation of 180 degrees about point E followed by a dilation with a scale factor of 2 centered at point E
4) a counterclockwise rotation of 90 degrees about point E followed by a dilation with a scale factor of 2 centered at point E

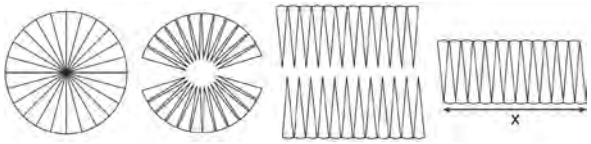
55 A regular decagon is rotated n degrees about its center, carrying the decagon onto itself. The value of n could be

1) 10°
2) 150°
3) 225°
4) 252°

56 The vertices of square $RSTV$ have coordinates $R(-1,5)$, $S(-3,1)$, $T(-7,3)$, and $V(-5,7)$. What is the perimeter of $RSTV$?

1) $\sqrt{20}$
2) $\sqrt{40}$
3) $4\sqrt{20}$
4) $4\sqrt{40}$

57 A circle with a radius of 5 was divided into 24 congruent sectors. The sectors were then rearranged, as shown in the diagram below.



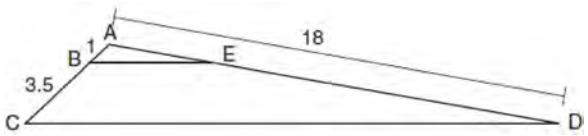
To the *nearest integer*, the value of x is

1) 31
2) 16
3) 12
4) 10

58 Line $y = 3x - 1$ is transformed by a dilation with a scale factor of 2 and centered at $(3,8)$. The line's image is

1) $y = 3x - 8$
2) $y = 3x - 4$
3) $y = 3x - 2$
4) $y = 3x - 1$

59 In the diagram below, triangle ACD has points B and E on sides $\overline{AC}$ and $\overline{AD}$, respectively, such that $\overline{BE} \parallel \overline{CD}$, $AB = 1$, $BC = 3.5$, and $AD = 18$.



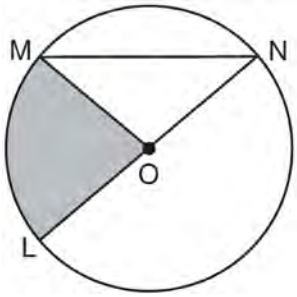
What is the length of $\overline{AE}$, to the *nearest tenth*?

1) 14.0
2) 5.1
3) 3.3
4) 4.0

60 The vertices of $\triangle JKL$ have coordinates $J(5,1)$, $K(-2,-3)$, and $L(-4,1)$. Under which transformation is the image $\triangle J'K'L'$ *not* congruent to $\triangle JKL$?

1) a translation of two units to the right and two units down
2) a counterclockwise rotation of 180 degrees around the origin
3) a reflection over the x-axis
4) a dilation with a scale factor of 2 and centered at the origin

61 In the diagram below of circle O, the area of the shaded sector LOM is 2π cm^2.



If the length of $\overline{NL}$ is 6 cm, what is m$\angle N$?

1) 10°
2) 20°
3) 40°
4) 80°

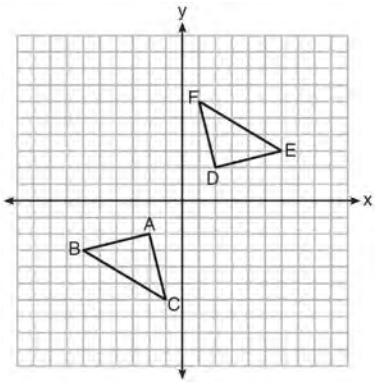
62 A 20-foot support post leans against a wall, making a 70° angle with the ground. To the *nearest tenth of a foot*, how far up the wall will the support post reach?

1) 6.8
2) 6.9
3) 18.7
4) 18.8

63 Tennis balls are sold in cylindrical cans with the balls stacked one on top of the other. A tennis ball has a diameter of 6.7 cm. To the *nearest cubic centimeter*, what is the minimum volume of the can that holds a stack of 4 tennis balls?

1) 236
2) 282
3) 564
4) 945

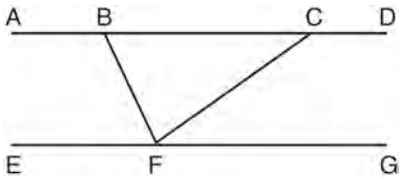
64 Triangle *ABC* and triangle *DEF* are graphed on the set of axes below.



Which sequence of transformations maps triangle *ABC* onto triangle *DEF*?

1) a reflection over the *x*-axis followed by a reflection over the *y*-axis
2) a 180° rotation about the origin followed by a reflection over the line $y = x$
3) a 90° clockwise rotation about the origin followed by a reflection over the *y*-axis
4) a translation 8 units to the right and 1 unit up followed by a 90° counterclockwise rotation about the origin

65 Steve drew line segments *ABCD*, *EFG*, *BF*, and *CF* as shown in the diagram below. Scalene $\triangle BFC$ is formed.



Which statement will allow Steve to prove $\overline{ABCD} \parallel \overline{EFG}$?

1) $\angle CFG \cong \angle FCB$
2) $\angle ABF \cong \angle BFC$
3) $\angle EFB \cong \angle CFB$
4) $\angle CBF \cong \angle GFC$

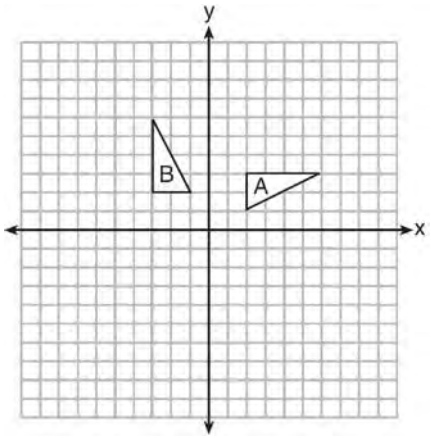
66 Point *Q* is on $\overline{MN}$ such that $MQ{:}QN = 2{:}3$. If *M* has coordinates $(3,5)$ and *N* has coordinates $(8,-5)$, the coordinates of *Q* are

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

67 An equation of a line perpendicular to the line represented by the equation $y = -\frac{1}{2}x - 5$ and passing through $(6,-4)$ is

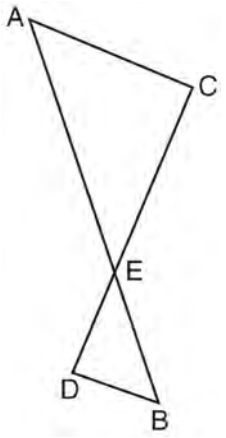
1) $y = -\frac{1}{2}x + 4$
2) $y = -\frac{1}{2}x - 1$
3) $y = 2x + 14$
4) $y = 2x - 16$

68 In the diagram below, which single transformation was used to map triangle *A* onto triangle *B*?



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

69 As shown in the diagram below, $\overline{AB}$ and $\overline{CD}$ intersect at E, and $\overline{AC} \parallel \overline{BD}$.



Given $\triangle AEC \sim \triangle BED$, which equation is true?

1) $\frac{CE}{DE} = \frac{EB}{EA}$

2) $\frac{AE}{BE} = \frac{AC}{BD}$

3) $\frac{EC}{AE} = \frac{BE}{ED}$

4) $\frac{ED}{EC} = \frac{AC}{BD}$

70 Quadrilateral $ABCD$ has diagonals $\overline{AC}$ and $\overline{BD}$. Which information is *not* sufficient to prove $ABCD$ is a parallelogram?

1) $\overline{AC}$ and $\overline{BD}$ bisect each other.

2) $\overline{AB} \cong \overline{CD}$ and $\overline{BC} \cong \overline{AD}$

3) $\overline{AB} \cong \overline{CD}$ and $\overline{AB} \parallel \overline{CD}$

4) $\overline{AB} \cong \overline{CD}$ and $\overline{BC} \parallel \overline{AD}$

71 A company is creating an object from a wooden cube with an edge length of 8.5 cm. A right circular cone with a diameter of 8 cm and an altitude of 8 cm will be cut out of the cube. Which expression represents the volume of the remaining wood?

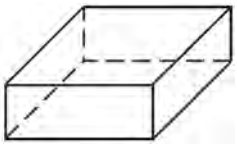
1) $(8.5)^3 - \pi(8)^2(8)$

2) $(8.5)^3 - \pi(4)^2(8)$

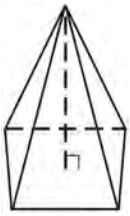
3) $(8.5)^3 - \frac{1}{3}\pi(8)^2(8)$

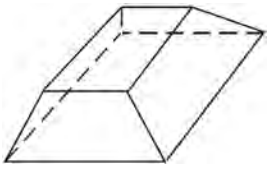
4) $(8.5)^3 - \frac{1}{3}\pi(4)^2(8)$

72 Which figure can have the same cross section as a sphere?

1) 

2) 

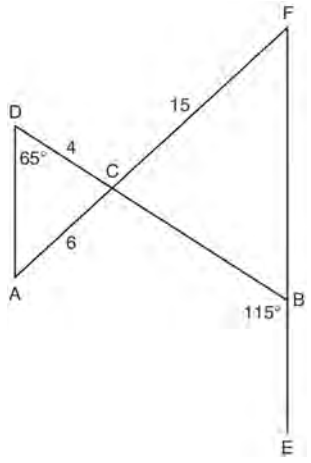
3) 

4) 

73 The diameter of a basketball is approximately 9.5 inches and the diameter of a tennis ball is approximately 2.5 inches. The volume of the basketball is about how many times greater than the volume of the tennis ball?

1) 3591
2) 65
3) 55
4) 4

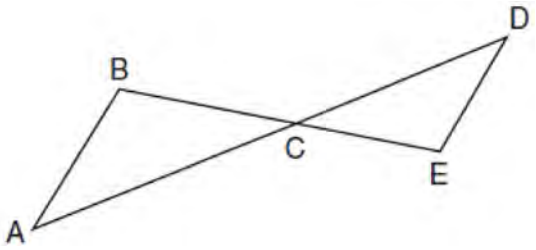
74 In the diagram below, $\overline{DB}$ and $\overline{AF}$ intersect at point C, and $\overline{AD}$ and $\overline{FBE}$ are drawn.



If $AC = 6$, $DC = 4$, $FC = 15$, $m\angle D = 65°$, and $m\angle CBE = 115°$, what is the length of $\overline{CB}$?

1) 10
2) 12
3) 17
4) 22.5

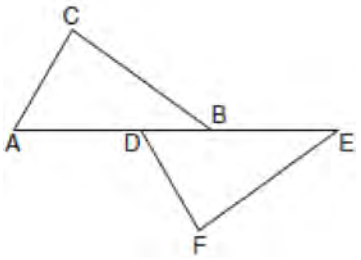
75 In the diagram below, $\overline{AD}$ intersects $\overline{BE}$ at C, and $\overline{AB} \parallel \overline{DE}$.



If $CD = 6.6$ cm, $DE = 3.4$ cm, $CE = 4.2$ cm, and $BC = 5.25$ cm, what is the length of $\overline{AC}$, to the *nearest hundredth of a centimeter*?

1) 2.70
2) 3.34
3) 5.28
4) 8.25

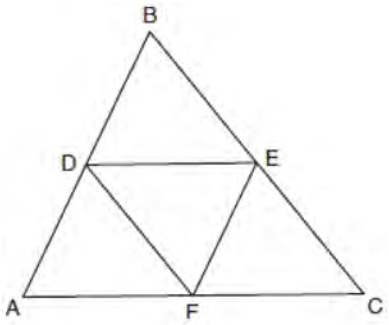
76 Kelly is completing a proof based on the figure below.



She was given that $\angle A \cong \angle EDF$, and has already proven $\overline{AB} \cong \overline{DE}$. Which pair of corresponding parts and triangle congruency method would *not* prove $\triangle ABC \cong \triangle DEF$?

1) $\overline{AC} \cong \overline{DF}$ and SAS
2) $\overline{BC} \cong \overline{EF}$ and SAS
3) $\angle C \cong \angle F$ and AAS
4) $\angle CBA \cong \angle FED$ and ASA

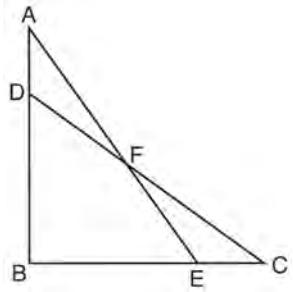
77 In the diagram below, $\overline{DE}$, $\overline{DF}$, and $\overline{EF}$ are midsegments of $\triangle ABC$.



The perimeter of quadrilateral $ADEF$ is equivalent to

1) $AB + BC + AC$
2) $\frac{1}{2}AB + \frac{1}{2}AC$
3) $2AB + 2AC$
4) $AB + AC$

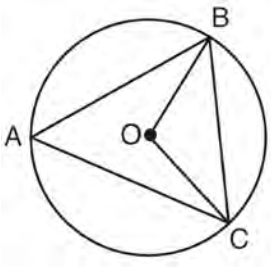
78 Given: $\triangle ABE$ and $\triangle CBD$ shown in the diagram below with $\overline{DB} \cong \overline{BE}$



Which statement is needed to prove $\triangle ABE \cong \triangle CBD$ using only SAS $\cong$ SAS?

1) $\angle CDB \cong \angle AEB$
2) $\angle AFD \cong \angle EFC$
3) $\overline{AD} \cong \overline{CE}$
4) $\overline{AE} \cong \overline{CD}$

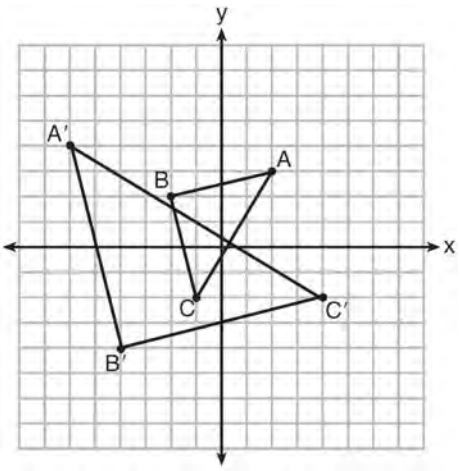
79 In the diagram below of circle O, $\overline{OB}$ and $\overline{OC}$ are radii, and chords $\overline{AB}$, $\overline{BC}$, and $\overline{AC}$ are drawn.



Which statement must always be true?

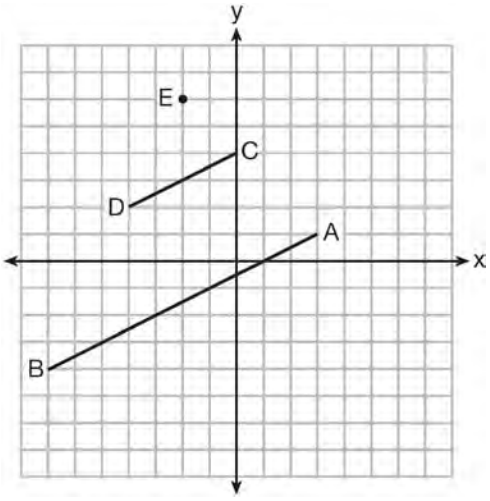
1) $\angle BAC \cong \angle BOC$
2) $\text{m}\angle BAC = \frac{1}{2}\text{m}\angle BOC$
3) $\triangle BAC$ and $\triangle BOC$ are isosceles.
4) The area of $\triangle BAC$ is twice the area of $\triangle BOC$.

80 Which sequence of transformations will map $\triangle ABC$ onto $\triangle A'B'C'$?



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

81 In the diagram below, $\overline{CD}$ is the image of $\overline{AB}$ after a dilation of scale factor k with center E.



Which ratio is equal to the scale factor k of the dilation?

1) $\frac{EC}{EA}$
2) $\frac{BA}{EA}$
3) $\frac{EA}{BA}$
4) $\frac{EA}{EC}$

82 Under which transformation would $\triangle A'B'C'$, the image of $\triangle ABC$, *not* be congruent to $\triangle ABC$?

1) reflection over the y-axis
2) rotation of 90° clockwise about the origin
3) translation of 3 units right and 2 units down
4) dilation with a scale factor of 2 centered at the origin

83 The endpoints of one side of a regular pentagon are $(-1,4)$ and $(2,3)$. What is the perimeter of the pentagon?

1) $\sqrt{10}$
2) $5\sqrt{10}$
3) $5\sqrt{2}$
4) $25\sqrt{2}$

84 An ice cream waffle cone can be modeled by a right circular cone with a base diameter of 6.6 centimeters and a volume of 54.45π cubic centimeters. What is the number of centimeters in the height of the waffle cone?

1) $3\frac{3}{4}$
2) 5
3) 15
4) $24\frac{3}{4}$

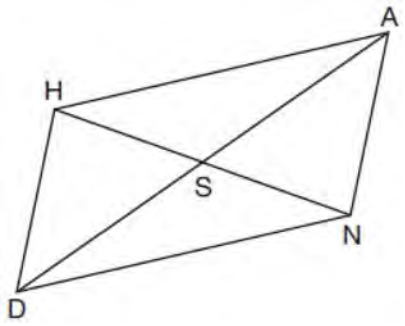
85 If $\triangle A'B'C'$ is the image of $\triangle ABC$, under which transformation will the triangles *not* be congruent?

1) reflection over the x-axis
2) translation to the left 5 and down 4
3) dilation centered at the origin with scale factor 2
4) rotation of 270° counterclockwise about the origin

86 Line segment RW has endpoints $R(-4,5)$ and $W(6,20)$. Point P is on $\overline{RW}$ such that $RP:PW$ is 2:3. What are the coordinates of point P?

1) $(2,9)$
2) $(0,11)$
3) $(2,14)$
4) $(10,2)$

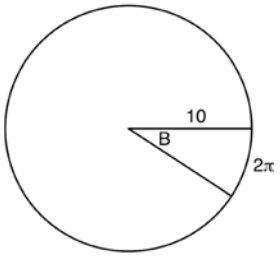
87 Parallelogram *HAND* is drawn below with diagonals $\overline{HN}$ and $\overline{AD}$ intersecting at *S*.



Which statement is always true?

1) $AN = \frac{1}{2}AD$
2) $AS = \frac{1}{2}AD$
3) $\angle AHS \cong \angle ANS$
4) $\angle HDS \cong \angle NDS$

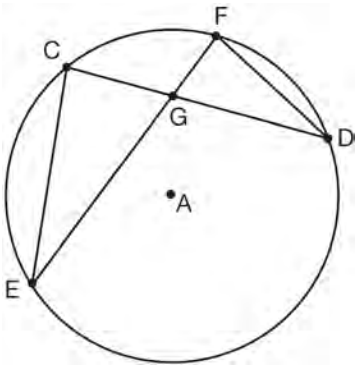
88 In the diagram below, the circle shown has radius 10. Angle *B* intercepts an arc with a length of 2π.



What is the measure of angle *B*, in radians?

1) $10 + 2\pi$
2) 20π
3) $\frac{\pi}{5}$
4) $\frac{5}{\pi}$

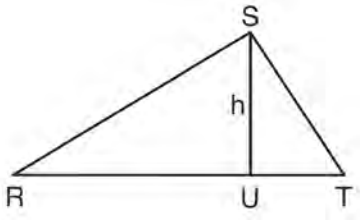
89 In the diagram of circle *A* shown below, chords $\overline{CD}$ and $\overline{EF}$ intersect at *G*, and chords $\overline{CE}$ and $\overline{FD}$ are drawn.



Which statement is *not* always true?

1) $\overline{CG} \cong \overline{FG}$
2) $\angle CEG \cong \angle FDG$
3) $\frac{CE}{EG} = \frac{FD}{DG}$
4) $\triangle CEG \sim \triangle FDG$

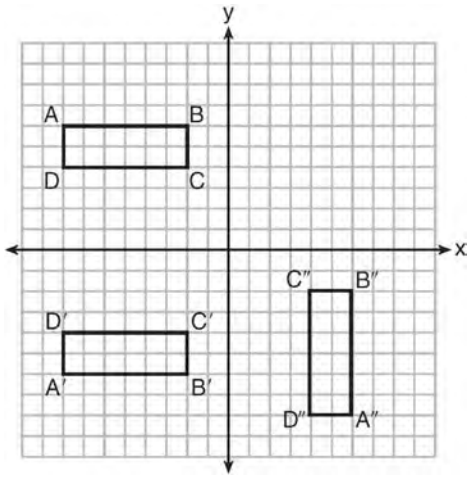
90 In $\triangle RST$ shown below, altitude $\overline{SU}$ is drawn to $\overline{RT}$ at *U*.



If $SU = h$, $UT = 12$, and $RT = 42$, which value of *h* will make $\triangle RST$ a right triangle with $\angle RST$ as a right angle?

1) $6\sqrt{3}$
2) $6\sqrt{10}$
3) $6\sqrt{14}$
4) $6\sqrt{35}$

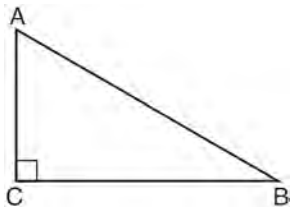
91 A sequence of transformations maps rectangle *ABCD* onto rectangle *A"B"C"D"*, as shown in the diagram below.



Which sequence of transformations maps *ABCD* onto *A'B'C'D'* and then maps *A'B'C'D'* onto *A"B"C"D"*?

1) a reflection followed by a rotation
2) a reflection followed by a translation
3) a translation followed by a rotation
4) a translation followed by a reflection

92 In scalene triangle *ABC* shown in the diagram below, $m\angle C = 90°$.



Which equation is always true?

1) $\sin A = \sin B$
2) $\cos A = \cos B$
3) $\cos A = \sin C$
4) $\sin A = \cos B$

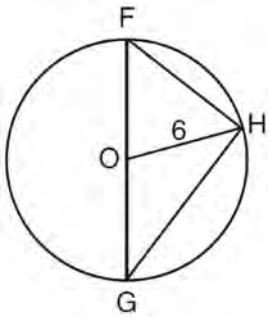
93 A shipping container is in the shape of a right rectangular prism with a length of 12 feet, a width of 8.5 feet, and a height of 4 feet. The container is completely filled with contents that weigh, on average, 0.25 pound per cubic foot. What is the weight, in pounds, of the contents in the container?

1) 1,632
2) 408
3) 102
4) 92

94 The line $3y = -2x + 8$ is transformed by a dilation centered at the origin. Which linear equation could be its image?

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

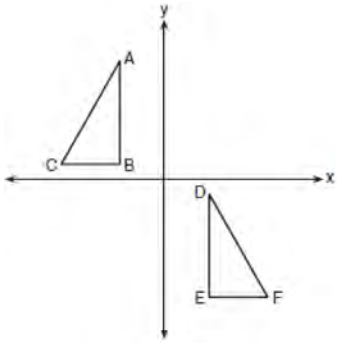
95 Triangle *FGH* is inscribed in circle *O*, the length of radius $\overline{OH}$ is 6, and $\overline{FH} \cong \overline{OG}$.



What is the area of the sector formed by angle *FOH*?

1) 2π
2) $\frac{3}{2}\pi$
3) 6π
4) 24π

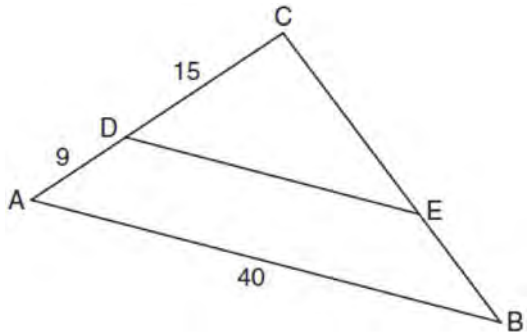
96 In the diagram below, $\triangle ABC \cong \triangle DEF$.



Which sequence of transformations maps $\triangle ABC$ onto $\triangle DEF$?

1) a reflection over the x-axis followed by a translation
2) a reflection over the y-axis followed by a translation
3) a rotation of 180° about the origin followed by a translation
4) a counterclockwise rotation of 90° about the origin followed by a translation

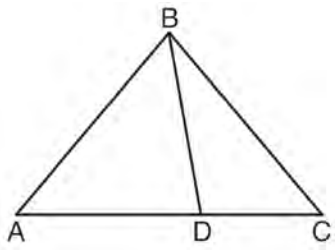
97 In the diagram of $\triangle ABC$ below, $\overline{DE}$ is parallel to $\overline{AB}$, $CD = 15$, $AD = 9$, and $AB = 40$.



The length of $\overline{DE}$ is

1) 15
2) 24
3) 25
4) 30

98 In the diagram below, $m\angle BDC = 100°$, $m\angle A = 50°$, and $m\angle DBC = 30°$.



Which statement is true?

1) $\triangle ABD$ is obtuse.
2) $\triangle ABC$ is isosceles.
3) $m\angle ABD = 80°$
4) $\triangle ABD$ is scalene.

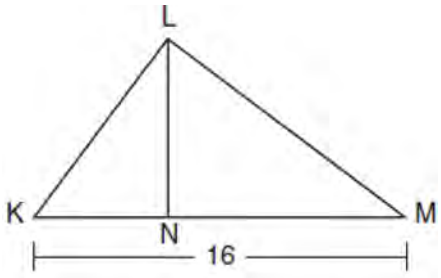
99 If $\triangle ABC$ is dilated by a scale factor of 3, which statement is true of the image $\triangle A'B'C'$?

1) $3A'B' = AB$
2) $B'C' = 3BC$
3) $m\angle A' = 3(m\angle A)$
4) $3(m\angle C') = m\angle C$

100 What is an equation of a line which passes through $(6,9)$ and is perpendicular to the line whose equation is $4x - 6y = 15$?

1) $y - 9 = -\frac{3}{2}(x - 6)$
2) $y - 9 = \frac{2}{3}(x - 6)$
3) $y + 9 = -\frac{3}{2}(x + 6)$
4) $y + 9 = \frac{2}{3}(x + 6)$

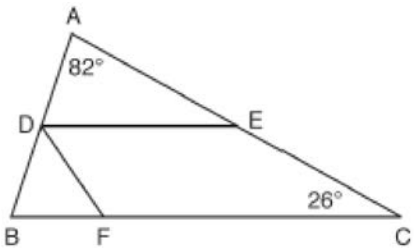
101 Kirstie is testing values that would make triangle *KLM* a right triangle when $\overline{LN}$ is an altitude, and *KM* = 16, as shown below.



Which lengths would make triangle *KLM* a right triangle?

1) *LM* = 13 and *KN* = 6
2) *LM* = 12 and *NM* = 9
3) *KL* = 11 and *KN* = 7
4) *LN* = 8 and *NM* = 10

102 In the diagram below, $\overline{DE}$ divides $\overline{AB}$ and $\overline{AC}$ proportionally, m∠*C* = 26°, m∠*A* = 82°, and $\overline{DF}$ bisects ∠*BDE*.



The measure of angle *DFB* is

1) 36°
2) 54°
3) 72°
4) 82°

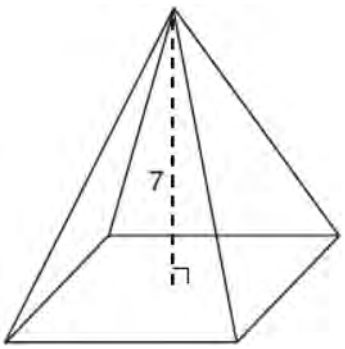
103 The ratio of similarity of △*BOY* to △*GRL* is 1:2. If *BO* = *x* + 3 and *GR* = 3*x* – 1, then the length of $\overline{GR}$ is

1) 5
2) 7
3) 10
4) 20

104 A quadrilateral has vertices with coordinates (–3,1), (0,3), (5,2), and (–1,–2). Which type of quadrilateral is this?

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

105 The pyramid shown below has a square base, a height of 7, and a volume of 84.



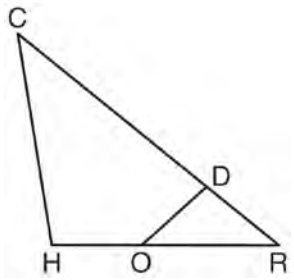
What is the length of the side of the base?

1) 6
2) 12
3) 18
4) 36

106 The Great Pyramid of Giza was constructed as a regular pyramid with a square base. It was built with an approximate volume of 2,592,276 cubic meters and a height of 146.5 meters. What was the length of one side of its base, to the *nearest meter*?

1) 73
2) 77
3) 133
4) 230

107 In triangle *CHR*, *O* is on $\overline{HR}$, and *D* is on $\overline{CR}$ so that $\angle H \cong \angle RDO$.



If $RD = 4$, $RO = 6$, and $OH = 4$, what is the length of $\overline{CD}$?

1) $2\frac{2}{3}$
2) $6\frac{2}{3}$
3) 11
4) 15

108 In a right triangle, $\sin(40 - x)° = \cos(3x)°$. What is the value of x?

1) 10
2) 15
3) 20
4) 25

109 What are the coordinates of the center and length of the radius of the circle whose equation is $x^2 + 6x + y^2 - 4y = 23$?

1) $(3,-2)$ and 36
2) $(3,-2)$ and 6
3) $(-3,2)$ and 36
4) $(-3,2)$ and 6

110 The equation of a circle is $x^2 + y^2 - 6y + 1 = 0$. What are the coordinates of the center and the length of the radius of this circle?

1) center $(0,3)$ and radius = $2\sqrt{2}$
2) center $(0,-3)$ and radius = $2\sqrt{2}$
3) center $(0,6)$ and radius = $\sqrt{35}$
4) center $(0,-6)$ and radius = $\sqrt{35}$

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

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

112 The equation of line *h* is $2x + y = 1$. Line *m* is the image of line *h* after a dilation of scale factor 4 with respect to the origin. What is the equation of the line *m*?

1) $y = -2x + 1$
2) $y = -2x + 4$
3) $y = 2x + 4$
4) $y = 2x + 1$

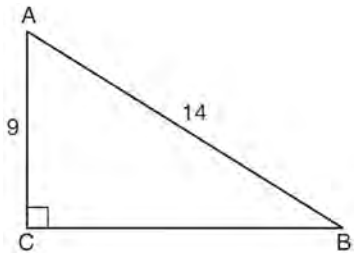
113 What is the area of a sector of a circle with a radius of 8 inches and formed by a central angle that measures 60°?

1) $\frac{8\pi}{3}$
2) $\frac{16\pi}{3}$
3) $\frac{32\pi}{3}$
4) $\frac{64\pi}{3}$

114 In right triangle ABC, $m\angle C = 90°$. If $\cos B = \frac{5}{13}$, which function also equals $\frac{5}{13}$?

1) $\tan A$
2) $\tan B$
3) $\sin A$
4) $\sin B$

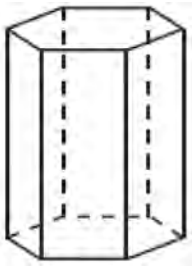
115 In the diagram of right triangle ABC shown below, $AB = 14$ and $AC = 9$.



What is the measure of $\angle A$, to the *nearest degree*?

1) 33
2) 40
3) 50
4) 57

116 A right hexagonal prism is shown below. A two-dimensional cross section that is perpendicular to the base is taken from the prism.



Which figure describes the two-dimensional cross section?

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

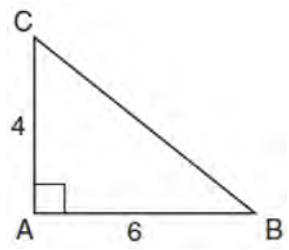
117 The line represented by the equation $4y = 3x + 7$ is transformed by a dilation centered at the origin. Which linear equation could represent its image?

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

118 The density of the American white oak tree is 752 kilograms per cubic meter. If the trunk of an American white oak tree has a circumference of 4.5 meters and the height of the trunk is 8 meters, what is the approximate number of kilograms of the trunk?

1) 13
2) 9694
3) 13,536
4) 30,456

119 In the diagram below, right triangle *ABC* has legs whose lengths are 4 and 6.



What is the volume of the three-dimensional object formed by continuously rotating the right triangle around $\overline{AB}$?

1) 32π
2) 48π
3) 96π
4) 144π

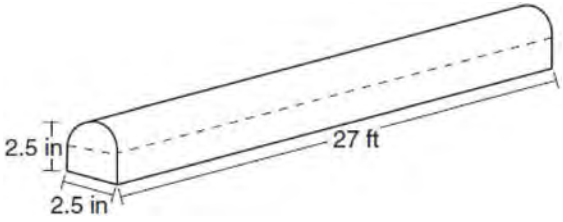
120 Which figure always has exactly four lines of reflection that map the figure onto itself?

1) square
2) rectangle
3) regular octagon
4) equilateral triangle

121 If the rectangle below is continuously rotated about side *w*, which solid figure is formed?

1) pyramid
2) rectangular prism
3) cone
4) cylinder

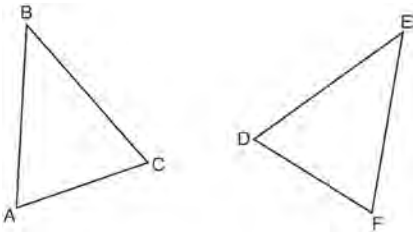
122 A fabricator is hired to make a 27-foot-long solid metal railing for the stairs at the local library. The railing is modeled by the diagram below. The railing is 2.5 inches high and 2.5 inches wide and is comprised of a rectangular prism and a half-cylinder.



How much metal, to the *nearest cubic inch*, will the railing contain?

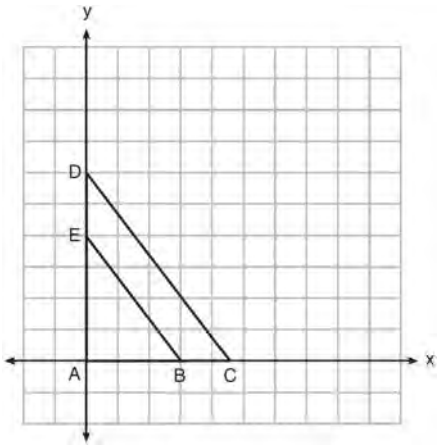
1) 151
2) 795
3) 1808
4) 2025

123 Which statement is sufficient evidence that $\triangle DEF$ is congruent to $\triangle ABC$?



1) $AB = DE$ and $BC = EF$
2) $\angle D \cong \angle A$, $\angle B \cong \angle E$, $\angle C \cong \angle F$
3) There is a sequence of rigid motions that maps $\overline{AB}$ onto $\overline{DE}$, $\overline{BC}$ onto $\overline{EF}$, and $\overline{AC}$ onto $\overline{DF}$.
4) There is a sequence of rigid motions that maps point *A* onto point *D*, $\overline{AB}$ onto $\overline{DE}$, and $\angle B$ onto $\angle E$.

124 In the diagram below, $\triangle ABE$ is the image of $\triangle ACD$ after a dilation centered at the origin. The coordinates of the vertices are $A(0,0)$, $B(3,0)$, $C(4.5,0)$, $D(0,6)$, and $E(0,4)$.



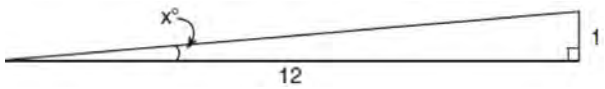
The ratio of the lengths of $\overline{BE}$ to $\overline{CD}$ is

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

125 The vertices of $\triangle PQR$ have coordinates $P(2,3)$, $Q(3,8)$, and $R(7,3)$. Under which transformation of $\triangle PQR$ are distance and angle measure preserved?

1) $(x,y) \rightarrow (2x,3y)$
2) $(x,y) \rightarrow (x+2,3y)$
3) $(x,y) \rightarrow (2x,y+3)$
4) $(x,y) \rightarrow (x+2,y+3)$

126 To build a handicapped-access ramp, the building code states that for every 1 inch of vertical rise in height, the ramp must extend out 12 inches horizontally, as shown in the diagram below.



What is the angle of inclination, x, of this ramp, to the *nearest hundredth of a degree*?

1) 4.76
2) 4.78
3) 85.22
4) 85.24

127 A parallelogram must be a rectangle when its

1) diagonals are perpendicular
2) diagonals are congruent
3) opposite sides are parallel
4) opposite sides are congruent

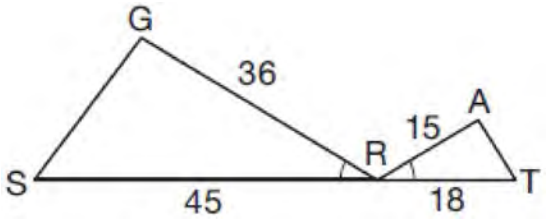
128 The coordinates of the vertices of $\triangle RST$ are $R(-2,-3)$, $S(8,2)$, and $T(4,5)$. Which type of triangle is $\triangle RST$?

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

129 A designer needs to create perfectly circular necklaces. The necklaces each need to have a radius of 10 cm. What is the largest number of necklaces that can be made from 1000 cm of wire?

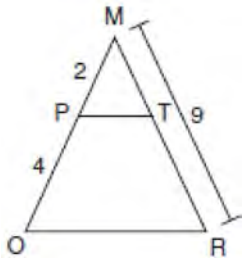
1) 15
2) 16
3) 31
4) 32

130 In the diagram below, $\angle GRS \cong \angle ART$, $GR = 36$, $SR = 45$, $AR = 15$, and $RT = 18$.



Which triangle similarity statement is correct?
1) $\triangle GRS \sim \triangle ART$ by AA.
2) $\triangle GRS \sim \triangle ART$ by SAS.
3) $\triangle GRS \sim \triangle ART$ by SSS.
4) $\triangle GRS$ is not similar to $\triangle ART$.

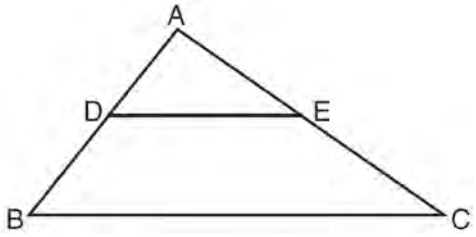
131 Given $\triangle MRO$ shown below, with trapezoid $PTRO$, $MR = 9$, $MP = 2$, and $PO = 4$.



What is the length of $\overline{TR}$?
1) 4.5
2) 5
3) 3
4) 6

132 The center of circle Q has coordinates $(3,-2)$. If circle Q passes through $R(7,1)$, what is the length of its diameter?
1) 50
2) 25
3) 10
4) 5

133 In the diagram below, $\triangle ABC \sim \triangle ADE$.

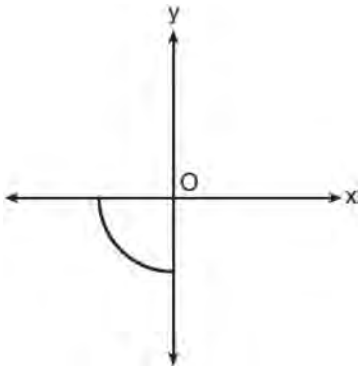


Which measurements are justified by this similarity?
1) $AD = 3$, $AB = 6$, $AE = 4$, and $AC = 12$
2) $AD = 5$, $AB = 8$, $AE = 7$, and $AC = 10$
3) $AD = 3$, $AB = 9$, $AE = 5$, and $AC = 10$
4) $AD = 2$, $AB = 6$, $AE = 5$, and $AC = 15$

134 Triangle $A'B'C'$ is the image of $\triangle ABC$ after a dilation followed by a translation. Which statement(s) would always be true with respect to this sequence of transformations?
I. $\triangle ABC \cong \triangle A'B'C'$
II. $\triangle ABC \sim \triangle A'B'C'$
III. $\overline{AB} \parallel \overline{A'B'}$
IV. $AA' = BB'$
1) II, only
2) I and II
3) II and III
4) II, III, and IV

135 If an equilateral triangle is continuously rotated around one of its medians, which 3-dimensional object is generated?
1) cone
2) pyramid
3) prism
4) sphere

136 Circle *O* is centered at the origin. In the diagram below, a quarter of circle *O* is graphed.



Which three-dimensional figure is generated when the quarter circle is continuously rotated about the *y*-axis?

1) cone
2) sphere
3) cylinder
4) hemisphere

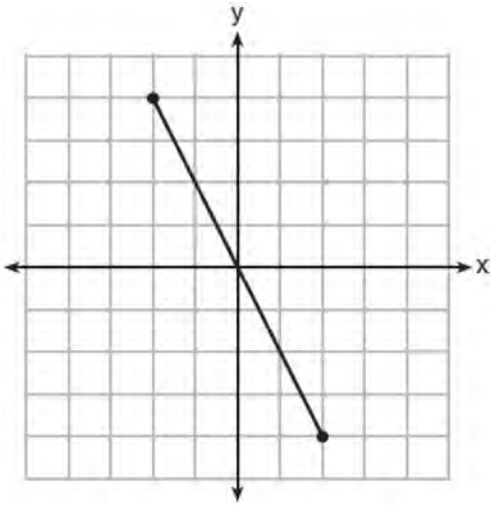
137 Which transformation would *not* always produce an image that would be congruent to the original figure?

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

138 A two-dimensional cross section is taken of a three-dimensional object. If this cross section is a triangle, what can *not* be the three-dimensional object?

1) cone
2) cylinder
3) pyramid
4) rectangular prism

139 What is an equation of the perpendicular bisector of the line segment shown in the diagram below?



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

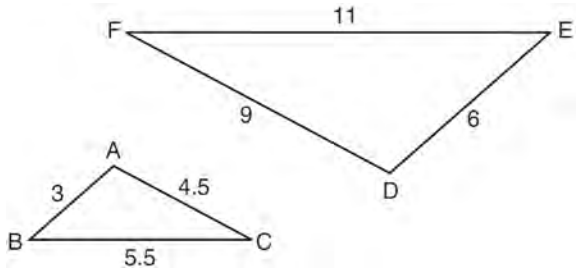
140 Which regular polygon has a minimum rotation of 45° to carry the polygon onto itself?

1) octagon
2) decagon
3) hexagon
4) pentagon

141 The cross section of a regular pyramid contains the altitude of the pyramid. The shape of this cross section is a

1) circle
2) square
3) triangle
4) rectangle

142 In the diagram below, $\triangle DEF$ is the image of $\triangle ABC$ after a clockwise rotation of 180° and a dilation where $AB = 3$, $BC = 5.5$, $AC = 4.5$, $DE = 6$, $FD = 9$, and $EF = 11$.



Which relationship must always be true?

1) $\frac{\text{m}\angle A}{\text{m}\angle D} = \frac{1}{2}$
2) $\frac{\text{m}\angle C}{\text{m}\angle F} = \frac{2}{1}$
3) $\frac{\text{m}\angle A}{\text{m}\angle C} = \frac{\text{m}\angle F}{\text{m}\angle D}$
4) $\frac{\text{m}\angle B}{\text{m}\angle E} = \frac{\text{m}\angle C}{\text{m}\angle F}$

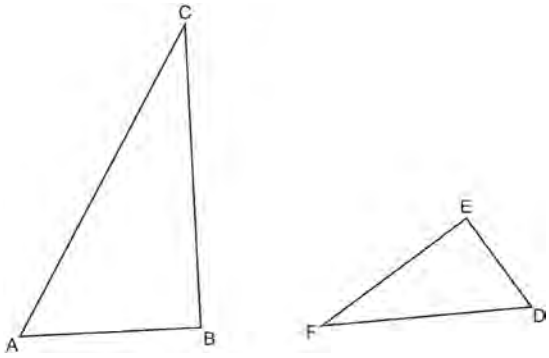
143 A regular pyramid has a square base. The perimeter of the base is 36 inches and the height of the pyramid is 15 inches. What is the volume of the pyramid in cubic inches?

1) 180
2) 405
3) 540
4) 1215

144 A ladder 20 feet long leans against a building, forming an angle of 71° with the level ground. To the *nearest foot*, how high up the wall of the building does the ladder touch the building?

1) 15
2) 16
3) 18
4) 19

145 Triangles *ABC* and *DEF* are drawn below.



If $AB = 9$, $BC = 15$, $DE = 6$, $EF = 10$, and $\angle B \cong \angle E$, which statement is true?

1) $\angle CAB \cong \angle DEF$
2) $\frac{AB}{CB} = \frac{FE}{DE}$
3) $\triangle ABC \sim \triangle DEF$
4) $\frac{AB}{DE} = \frac{FE}{CB}$

146 Point *P* is on the directed line segment from point $X(-6,-2)$ to point $Y(6,7)$ and divides the segment in the ratio $1:5$. What are the coordinates of point *P*?

1) $\left(4, 5\frac{1}{2}\right)$
2) $\left(-\frac{1}{2}, -4\right)$
3) $\left(-4\frac{1}{2}, 0\right)$
4) $\left(-4, -\frac{1}{2}\right)$

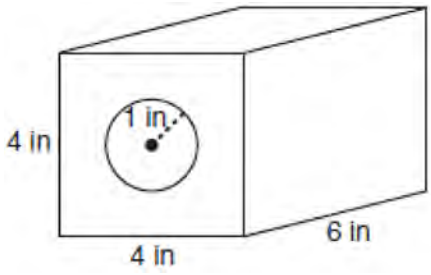
147 In the two distinct acute triangles *ABC* and *DEF*, $\angle B \cong \angle E$. Triangles *ABC* and *DEF* are congruent when there is a sequence of rigid motions that maps

1) $\angle A$ onto $\angle D$, and $\angle C$ onto $\angle F$
2) $\overline{AC}$ onto $\overline{DF}$, and $\overline{BC}$ onto $\overline{EF}$
3) $\angle C$ onto $\angle F$, and $\overline{BC}$ onto $\overline{EF}$
4) point *A* onto point *D*, and $\overline{AB}$ onto $\overline{DE}$

148 A plane intersects a hexagonal prism. The plane is perpendicular to the base of the prism. Which two-dimensional figure is the cross section of the plane intersecting the prism?

1) triangle
2) trapezoid
3) hexagon
4) rectangle

149 A solid metal prism has a rectangular base with sides of 4 inches and 6 inches, and a height of 4 inches. A hole in the shape of a cylinder, with a radius of 1 inch, is drilled through the entire length of the rectangular prism.



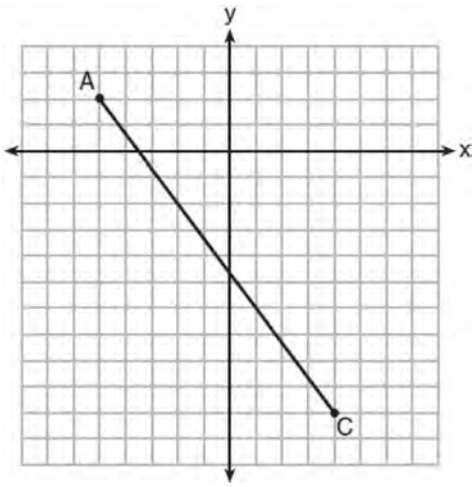
What is the approximate volume of the remaining solid, in cubic inches?

1) 19
2) 77
3) 93
4) 96

150 Which equation represents a line that is perpendicular to the line represented by $2x - y = 7$?

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

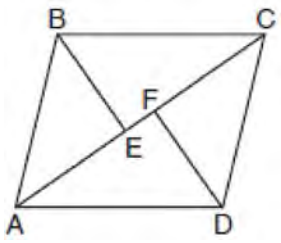
151 In the diagram below, $\overline{AC}$ has endpoints with coordinates $A(-5,2)$ and $C(4,-10)$.



If *B* is a point on $\overline{AC}$ and $AB:BC = 1:2$, what are the coordinates of *B*?

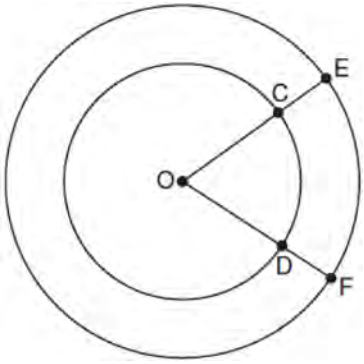
1) $(-2,-2)$
2) $\left(-\frac{1}{2},-4\right)$
3) $\left(0,-\frac{14}{3}\right)$
4) $(1,-6)$

152 In the diagram below, if $\triangle ABE \cong \triangle CDF$ and $\overline{AEFC}$ is drawn, then it could be proven that quadrilateral *ABCD* is a



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

153 In the diagram below, two concentric circles with center *O*, and radii $\overline{OC}$, $\overline{OD}$, $\overline{OGE}$, and $\overline{ODF}$ are drawn.



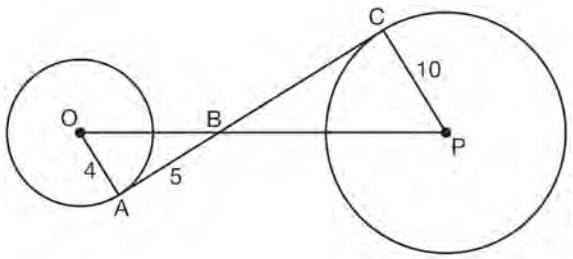
If $OC = 4$ and $OE = 6$, which relationship between the length of arc *EF* and the length of arc *CD* is always true?

1) The length of arc *EF* is 2 units longer than the length of arc *CD*.
2) The length of arc *EF* is 4 units longer than the length of arc *CD*.
3) The length of arc *EF* is 1.5 times the length of arc *CD*.
4) The length of arc *EF* is 2.0 times the length of arc *CD*.

154 The equation of a circle is $x^2 + y^2 - 12y + 20 = 0$. What are the coordinates of the center and the length of the radius of the circle?

1) center $(0,6)$ and radius 4
2) center $(0,-6)$ and radius 4
3) center $(0,6)$ and radius 16
4) center $(0,-6)$ and radius 16

155 In the diagram shown below, $\overline{AC}$ is tangent to circle *O* at *A* and to circle *P* at *C*, $\overline{OP}$ intersects $\overline{AC}$ at *B*, $OA = 4$, $AB = 5$, and $PC = 10$.



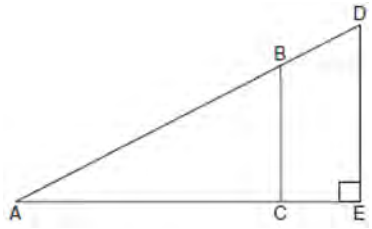
What is the length of $\overline{BC}$?

1) 6.4
2) 8
3) 12.5
4) 16

156 Parallelogram *ABCD* has coordinates $A(0,7)$ and $C(2,1)$. Which statement would prove that *ABCD* is a rhombus?

1) The midpoint of $\overline{AC}$ is $(1,4)$.
2) The length of $\overline{BD}$ is $\sqrt{40}$.
3) The slope of $\overline{BD}$ is $\frac{1}{3}$.
4) The slope of $\overline{AB}$ is $\frac{1}{3}$.

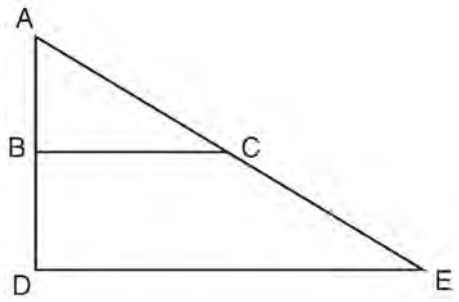
157 In the diagram of right triangle ADE below, $\overline{BC} \parallel \overline{DE}$.



Which ratio is always equivalent to the sine of $\angle A$?

1) $\frac{AD}{DE}$
2) $\frac{AE}{AD}$
3) $\frac{BC}{AB}$
4) $\frac{AB}{AC}$

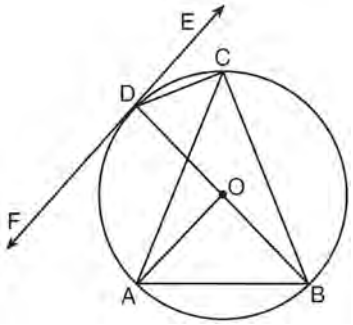
158 The image of $\triangle ABC$ after a dilation of scale factor k centered at point A is $\triangle ADE$, as shown in the diagram below.



Which statement is always true?

1) $2AB = AD$
2) $\overline{AD} \perp \overline{DE}$
3) $AC = CE$
4) $\overline{BC} \parallel \overline{DE}$

159 In the diagram below, $\overline{DC}$, $\overline{AC}$, $\overline{DOB}$, $\overline{CB}$, and $\overline{AB}$ are chords of circle O, $\overleftrightarrow{FDE}$ is tangent at point D, and radius $\overline{AO}$ is drawn. Sam decides to apply this theorem to the diagram: "An angle inscribed in a semi-circle is a right angle."



Which angle is Sam referring to?

1) $\angle AOB$
2) $\angle BAC$
3) $\angle DCB$
4) $\angle FDB$

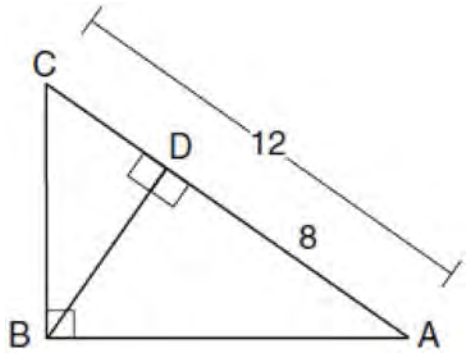
160 Two right triangles must be congruent if

1) an acute angle in each triangle is congruent
2) the lengths of the hypotenuses are equal
3) the corresponding legs are congruent
4) the areas are equal

161 The coordinates of vertices A and B of $\triangle ABC$ are $A(3,4)$ and $B(3,12)$. If the area of $\triangle ABC$ is 24 square units, what could be the coordinates of point C?

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

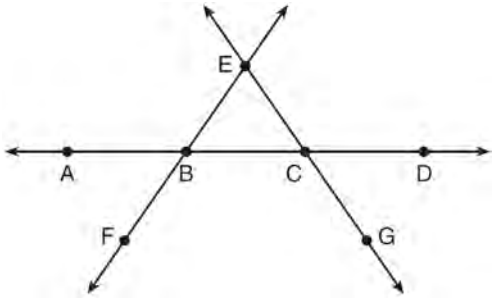
162 In the diagram below of $\triangle ABC$, $\angle ABC$ is a right angle, $AC = 12$, $AD = 8$, and altitude $\overline{BD}$ is drawn.



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

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

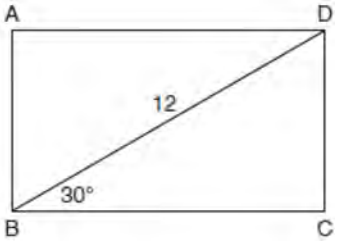
163 In the diagram below, $\overleftrightarrow{FE}$ bisects $\overline{AC}$ at B, and $\overleftrightarrow{GE}$ bisects $\overline{BD}$ at C.



Which statement is always true?

1) $\overline{AB} \cong \overline{DC}$
2) $\overline{FB} \cong \overline{EB}$
3) $\overleftrightarrow{BD}$ bisects $\overline{GE}$ at C.
4) $\overleftrightarrow{AC}$ bisects $\overline{FE}$ at B.

164 The diagram shows rectangle $ABCD$, with diagonal $\overline{BD}$.



What is the perimeter of rectangle $ABCD$, to the *nearest tenth*?

1) 28.4
2) 32.8
3) 48.0
4) 62.4

165 What are the coordinates of the point on the directed line segment from $K(-5,-4)$ to $L(5,1)$ that partitions the segment into a ratio of 3 to 2?

1) $(-3,-3)$
2) $(-1,-2)$
3) $\left(0,-\frac{3}{2}\right)$
4) $(1,-1)$

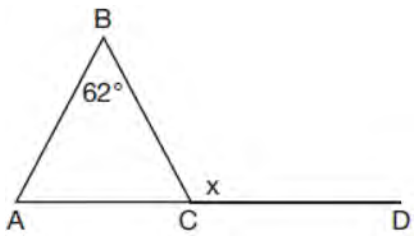
166 The line whose equation is $3x - 5y = 4$ is dilated by a scale factor of $\frac{5}{3}$ centered at the origin. Which statement is correct?

1) The image of the line has the same slope as the pre-image but a different y-intercept.
2) The image of the line has the same y-intercept as the pre-image but a different slope.
3) The image of the line has the same slope and the same y-intercept as the pre-image.
4) The image of the line has a different slope and a different y-intercept from the pre-image.

167 A triangle is dilated by a scale factor of 3 with the center of dilation at the origin. Which statement is true?
1) The area of the image is nine times the area of the original triangle.
2) The perimeter of the image is nine times the perimeter of the original triangle.
3) The slope of any side of the image is three times the slope of the corresponding side of the original triangle.
4) The measure of each angle in the image is three times the measure of the corresponding angle of the original triangle.

168 Which transformation would result in the perimeter of a triangle being different from the perimeter of its image?
1) $(x,y) \rightarrow (y,x)$
2) $(x,y) \rightarrow (x,-y)$
3) $(x,y) \rightarrow (4x,4y)$
4) $(x,y) \rightarrow (x+2,y-5)$

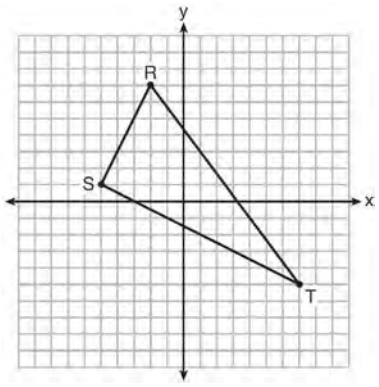
169 Given $\triangle ABC$ with $m\angle B = 62°$ and side $\overline{AC}$ extended to D, as shown below.



Which value of x makes $\overline{AB} \cong \overline{CB}$?
1) 59°
2) 62°
3) 118°
4) 121°

170 A farmer has 64 feet of fence to enclose a rectangular vegetable garden. Which dimensions would result in the biggest area for this garden?
1) the length and the width are equal
2) the length is 2 more than the width
3) the length is 4 more than the width
4) the length is 6 more than the width

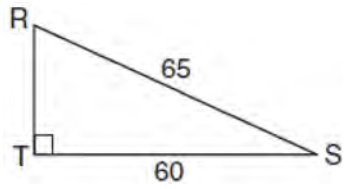
171 Triangle RST is graphed on the set of axes below.



How many square units are in the area of $\triangle RST$?
1) $9\sqrt{3}+15$
2) $9\sqrt{5}+15$
3) 45
4) 90

172 A three-inch line segment is dilated by a scale factor of 6 and centered at its midpoint. What is the length of its image?
1) 9 inches
2) 2 inches
3) 15 inches
4) 18 inches

173 In the diagram of $\triangle RST$ below, $m\angle T = 90°$, $RS = 65$, and $ST = 60$.



What is the measure of $\angle S$, to the *nearest degree*?

1) 23°
2) 43°
3) 47°
4) 67°

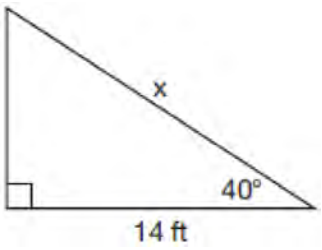
174 In a circle with a diameter of 32, the area of a sector is $\frac{512\pi}{3}$. The measure of the angle of the sector, in radians, is

1) $\frac{\pi}{3}$
2) $\frac{4\pi}{3}$
3) $\frac{16\pi}{3}$
4) $\frac{64\pi}{3}$

175 A fish tank in the shape of a rectangular prism has dimensions of 14 inches, 16 inches, and 10 inches. The tank contains 1680 cubic inches of water. What percent of the fish tank is empty?

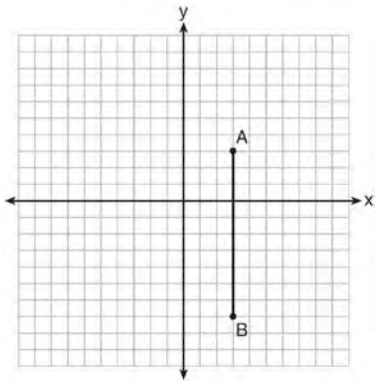
1) 10
2) 25
3) 50
4) 75

176 Given the right triangle in the diagram below, what is the value of x, to the *nearest foot*?



1) 11
2) 17
3) 18
4) 22

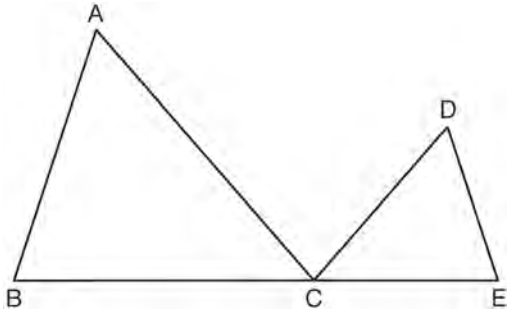
177 The graph below shows $\overline{AB}$, which is a chord of circle O. The coordinates of the endpoints of $\overline{AB}$ are $A(3,3)$ and $B(3,-7)$. The distance from the midpoint of $\overline{AB}$ to the center of circle O is 2 units.



What could be a correct equation for circle O?

1) $(x-1)^2 + (y+2)^2 = 29$
2) $(x+5)^2 + (y-2)^2 = 29$
3) $(x-1)^2 + (y-2)^2 = 25$
4) $(x-5)^2 + (y+2)^2 = 25$

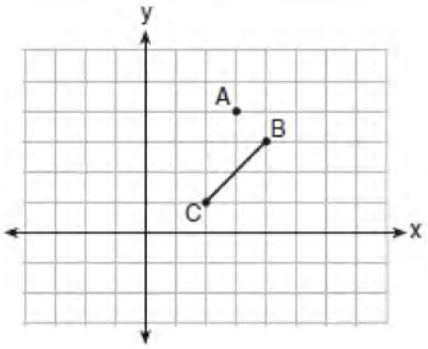
178 In the diagram below, $\triangle ABC \sim \triangle DEC$.



If $AC = 12$, $DC = 7$, $DE = 5$, and the perimeter of $\triangle ABC$ is 30, what is the perimeter of $\triangle DEC$?

1) 12.5
2) 14.0
3) 14.8
4) 17.5

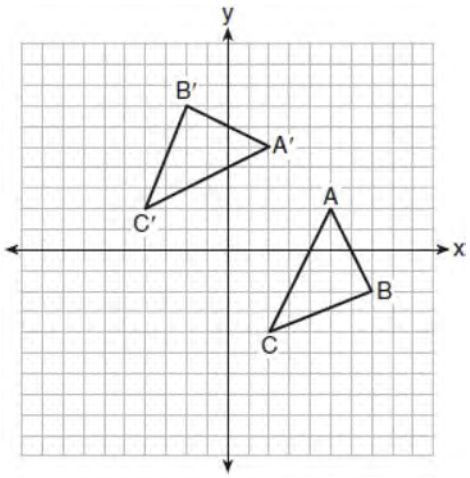
179 On the graph below, point $A(3,4)$ and $\overline{BC}$ with coordinates $B(4,3)$ and $C(2,1)$ are graphed.



What are the coordinates of B' and C' after $\overline{BC}$ undergoes a dilation centered at point A with a scale factor of 2?

1) $B'(5,2)$ and $C'(1,-2)$
2) $B'(6,1)$ and $C'(0,-1)$
3) $B'(5,0)$ and $C'(1,-2)$
4) $B'(5,2)$ and $C'(3,0)$

180 The graph below shows two congruent triangles, ABC and $A'B'C'$.



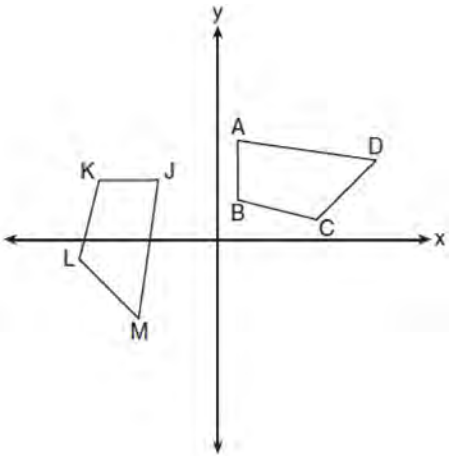
Which rigid motion would map $\triangle ABC$ onto $\triangle A'B'C'$?

1) a rotation of 90 degrees counterclockwise about the origin
2) a translation of three units to the left and three units up
3) a rotation of 180 degrees about the origin
4) a reflection over the line $y = x$

181 A hemispherical water tank has an inside diameter of 10 feet. If water has a density of 62.4 pounds per cubic foot, what is the weight of the water in a full tank, to the *nearest pound*?

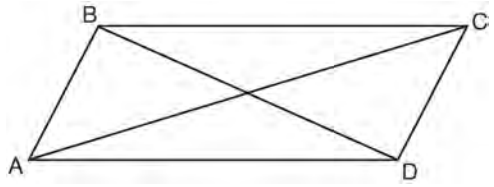
1) 16,336
2) 32,673
3) 130,690
4) 261,381

182 In the diagram below, a sequence of rigid motions maps *ABCD* onto *JKLM*.



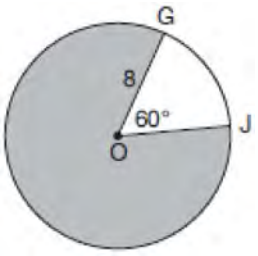
If m∠*A* = 82°, m∠*B* = 104°, and m∠*L* = 121°, the measure of $\angle M$ is
1) 53°
2) 82°
3) 104°
4) 121°

183 Quadrilateral *ABCD* with diagonals $\overline{AC}$ and $\overline{BD}$ is shown in the diagram below.



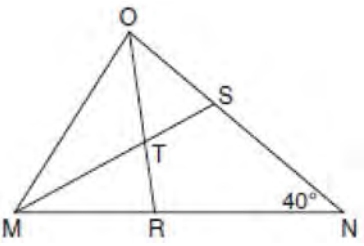
Which information is *not* enough to prove *ABCD* is a parallelogram?
1) $\overline{AB} \cong \overline{CD}$ and $\overline{AB} \parallel \overline{DC}$
2) $\overline{AB} \cong \overline{CD}$ and $\overline{BC} \cong \overline{DA}$
3) $\overline{AB} \cong \overline{CD}$ and $\overline{BC} \parallel \overline{AD}$
4) $\overline{AB} \parallel \overline{DC}$ and $\overline{BC} \parallel \overline{AD}$

184 In the diagram below of circle *O*, *GO* = 8 and m∠*GOJ* = 60°.



What is the area, in terms of π, of the shaded region?
1) $\frac{4\pi}{3}$
2) $\frac{20\pi}{3}$
3) $\frac{32\pi}{3}$
4) $\frac{160\pi}{3}$

185 In the diagram below of triangle *MNO*, $\angle M$ and $\angle O$ are bisected by $\overline{MS}$ and $\overline{OR}$, respectively. Segments *MS* and *OR* intersect at *T*, and m∠*N* = 40°.

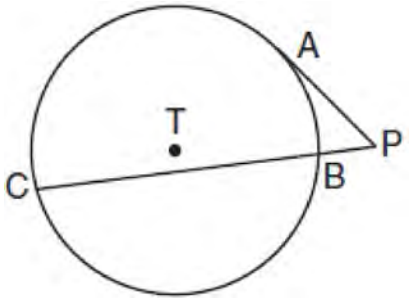


If m∠*TMR* = 28°, the measure of angle *OTS* is
1) 40°
2) 50°
3) 60°
4) 70°

186 If *ABCD* is a parallelogram, which statement would prove that *ABCD* is a rhombus?

1) $\angle ABC \cong \angle CDA$
2) $\overline{AC} \cong \overline{BD}$
3) $\overline{AC} \perp \overline{BD}$
4) $\overline{AB} \perp \overline{CD}$

187 In the diagram shown below, $\overline{PA}$ is tangent to circle *T* at *A*, and secant $\overline{PBC}$ is drawn where point *B* is on circle *T*.



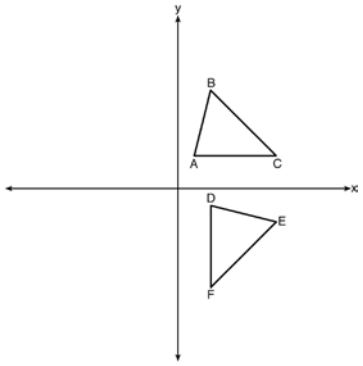
If $PB = 3$ and $BC = 15$, what is the length of $\overline{PA}$?

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

188 The coordinates of the endpoints of $\overline{AB}$ are $A(-8,-2)$ and $B(16,6)$. Point *P* is on $\overline{AB}$. What are the coordinates of point *P*, such that *AP*:*PB* is 3:5?

1) $(1,1)$
2) $(7,3)$
3) $(9.6,3.6)$
4) $(6.4,2.8)$

189 The image of $\triangle ABC$ after a rotation of 90° clockwise about the origin is $\triangle DEF$, as shown below.



Which statement is true?

1) $\overline{BC} \cong \overline{DE}$
2) $\overline{AB} \cong \overline{DF}$
3) $\angle C \cong \angle E$
4) $\angle A \cong \angle D$

190 Kevin's work for deriving the equation of a circle is shown below.

$$x^2 + 4x = -(y^2 - 20)$$

STEP 1 $x^2 + 4x = -y^2 + 20$

STEP 2 $x^2 + 4x + 4 = -y^2 + 20 - 4$

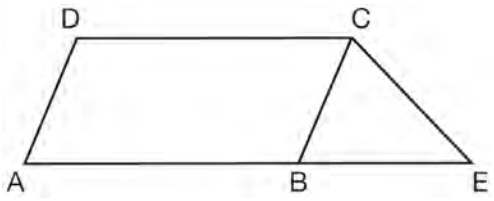
STEP 3 $(x+2)^2 = -y^2 + 20 - 4$

STEP 4 $(x+2)^2 + y^2 = 16$

In which step did he make an error in his work?

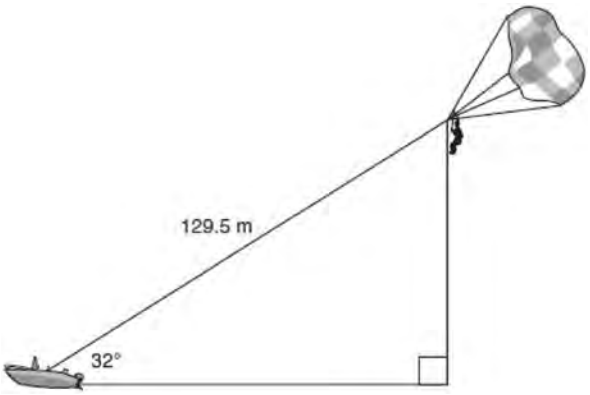
1) Step 1
2) Step 2
3) Step 3
4) Step 4

191 In the diagram below, *ABCD* is a parallelogram, $\overline{AB}$ is extended through *B* to *E*, and $\overline{CE}$ is drawn.



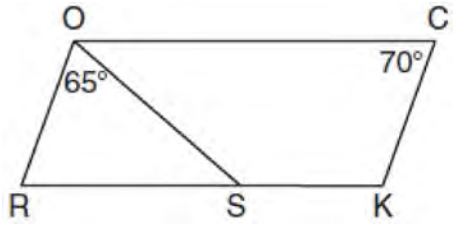
If $\overline{CE} \cong \overline{BE}$ and m$\angle D = 112°$, what is m$\angle E$?
1) 44°
2) 56°
3) 68°
4) 112°

192 A man was parasailing above a lake at an angle of elevation of 32° from a boat, as modeled in the diagram below.



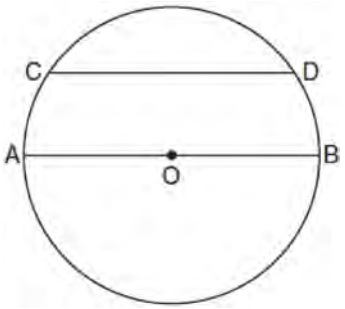
If 129.5 meters of cable connected the boat to the parasail, approximately how many meters above the lake was the man?
1) 68.6
2) 80.9
3) 109.8
4) 244.4

193 In the diagram below of parallelogram *ROCK*, m$\angle C$ is 70° and m$\angle ROS$ is 65°.



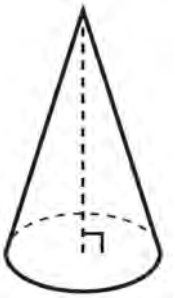
What is m$\angle KSO$?
1) 45°
2) 110°
3) 115°
4) 135°

194 In the diagram below of circle *O*, chord $\overline{CD}$ is parallel to diameter $\overline{AOB}$ and m$\overset{\frown}{CD} = 130$.



What is m$\overset{\frown}{AC}$?
1) 25
2) 50
3) 65
4) 115

195 William is drawing pictures of cross sections of the right circular cone below.



Which drawing can *not* be a cross section of a cone?

1) 

2) 

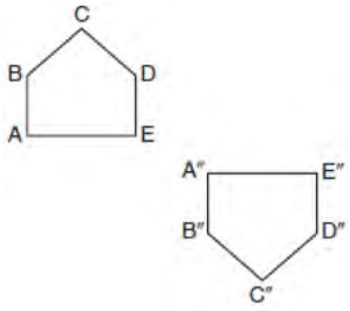
3) 

4) 

196 What are the coordinates of the center and the length of the radius of the circle represented by the equation $x^2 + y^2 - 4x + 8y + 11 = 0$?

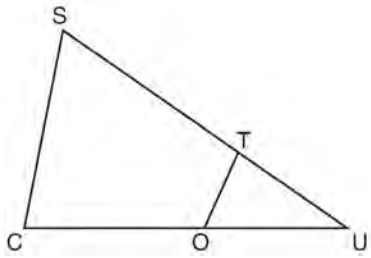
1) center $(2,-4)$ and radius 3
2) center $(-2,4)$ and radius 3
3) center $(2,-4)$ and radius 9
4) center $(-2,4)$ and radius 9

197 Identify which sequence of transformations could map pentagon *ABCDE* onto pentagon *A"B"C"D"E"*, as shown below.



1) dilation followed by a rotation
2) translation followed by a rotation
3) line reflection followed by a translation
4) line reflection followed by a line reflection

198 In $\triangle SCU$ shown below, points *T* and *O* are on $\overline{SU}$ and $\overline{CU}$, respectively. Segment *OT* is drawn so that $\angle C \cong \angle OTU$.



If $TU = 4$, $OU = 5$, and $OC = 7$, what is the length of $\overline{ST}$?

1) 5.6
2) 8.75
3) 11
4) 15

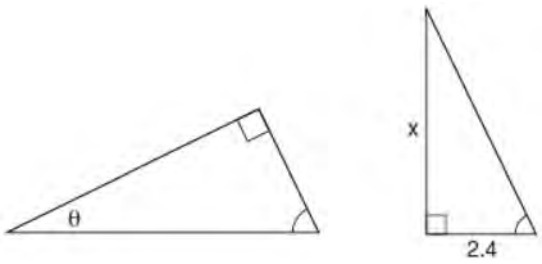
199 The 2010 U.S. Census populations and population densities are shown in the table below.

State	Population Density $\left(\frac{\text{people}}{\text{mi}^2}\right)$	Population in 2010
Florida	350.6	18,801,310
Illinois	231.1	12,830,632
New York	411.2	19,378,102
Pennsylvania	283.9	12,702,379

Based on the table above, which list has the states' areas, in square miles, in order from largest to smallest?

1) Illinois, Florida, New York, Pennsylvania
2) New York, Florida, Illinois, Pennsylvania
3) New York, Florida, Pennsylvania, Illinois
4) Pennsylvania, New York, Florida, Illinois

200 The diagram below shows two similar triangles.



If $\tan\theta = \frac{3}{7}$, what is the value of *x*, to the *nearest tenth*?

1) 1.2
2) 5.6
3) 7.6
4) 8.8

201 Segment *CD* is the perpendicular bisector of $\overline{AB}$ at *E*. Which pair of segments does *not* have to be congruent?

1) $\overline{AD}, \overline{BD}$
2) $\overline{AC}, \overline{BC}$
3) $\overline{AE}, \overline{BE}$
4) $\overline{DE}, \overline{CE}$

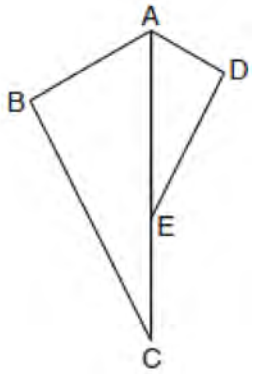
202 In right triangle *ABC*, $m\angle A = 32°$, $m\angle B = 90°$, and $AE = 6.2$ cm. What is the length of $\overline{BC}$, to the *nearest tenth of a centimeter*?

1) 3.3
2) 3.9
3) 5.3
4) 11.7

203 Linda is designing a circular piece of stained glass with a diameter of 7 inches. She is going to sketch a square inside the circular region. To the *nearest tenth of an inch*, the largest possible length of a side of the square is

1) 3.5
2) 4.9
3) 5.0
4) 6.9

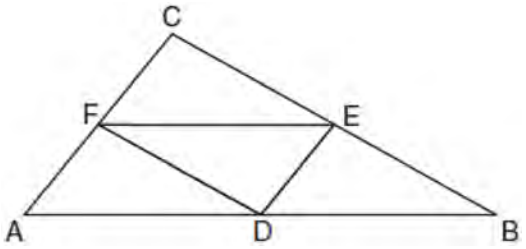
204 In the diagram below, $\triangle ADE$ is the image of $\triangle ABC$ after a reflection over the line AC followed by a dilation of scale factor $\frac{AE}{AC}$ centered at point A.



Which statement must be true?

1) $m\angle BAC \cong m\angle AED$
2) $m\angle ABC \cong m\angle ADE$
3) $m\angle DAE \cong \frac{1}{2} m\angle BAC$
4) $m\angle ACB \cong \frac{1}{2} m\angle DAB$

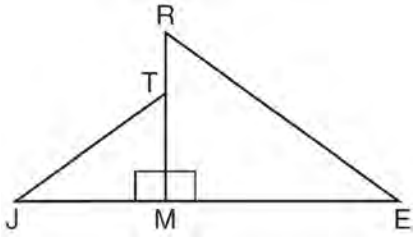
205 In the diagram below of $\triangle ABC$, D, E, and F are the midpoints of $\overline{AB}$, $\overline{BC}$, and $\overline{CA}$, respectively.



What is the ratio of the area of $\triangle CFE$ to the area of $\triangle CAB$?

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

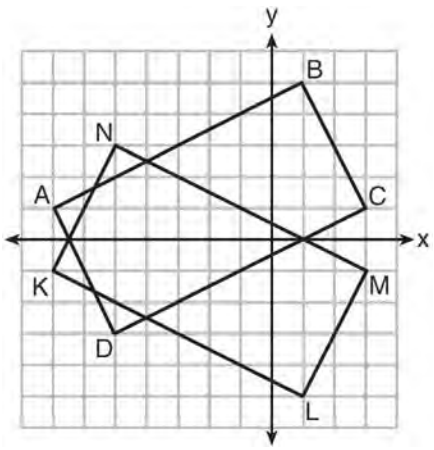
206 In the diagram below, $\triangle ERM \sim \triangle JTM$.



Which statement is always true?

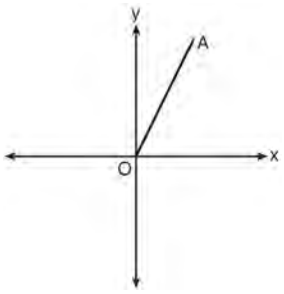
1) $\cos J = \frac{RM}{RE}$
2) $\cos R = \frac{JM}{JT}$
3) $\tan T = \frac{RM}{EM}$
4) $\tan E = \frac{TM}{JM}$

207 On the set of axes below, rectangle *ABCD* can be proven congruent to rectangle *KLMN* using which transformation?



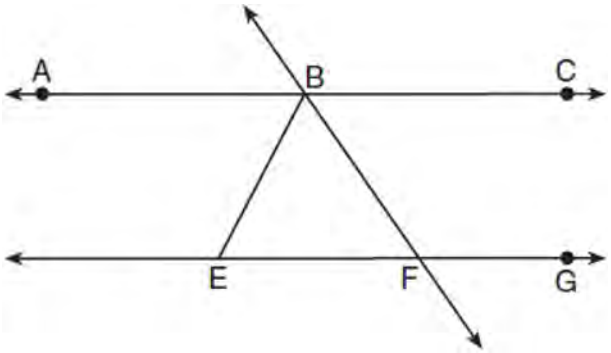
1) rotation
2) translation
3) reflection over the *x*-axis
4) reflection over the *y*-axis

208 Which transformation of $\overline{OA}$ would result in an image parallel to $\overline{OA}$?



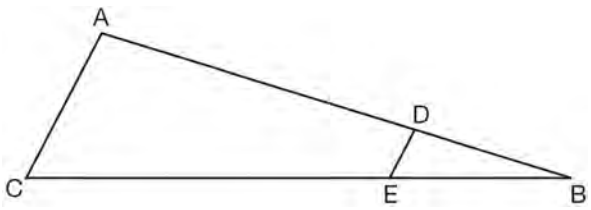
1) a translation of two units down
2) a reflection over the *x*-axis
3) a reflection over the *y*-axis
4) a clockwise rotation of 90° about the origin

209 As shown in the diagram below, $\overleftrightarrow{ABC} \parallel \overleftrightarrow{EFG}$ and $\overline{BF} \cong \overline{EF}$.



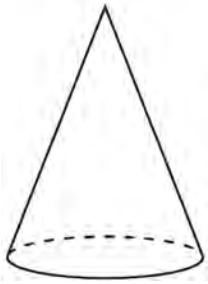
If m$\angle CBF = 42.5°$, then m$\angle EBF$ is
1) 42.5°
2) 68.75°
3) 95°
4) 137.5°

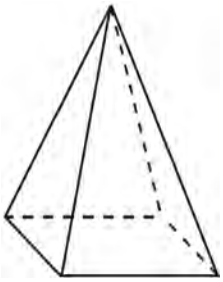
210 In the diagram of $\triangle ABC$, points *D* and *E* are on $\overline{AB}$ and $\overline{CB}$, respectively, such that $\overline{AC} \parallel \overline{DE}$.

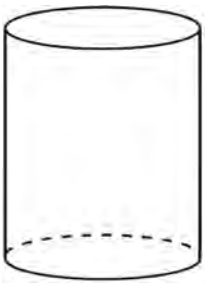


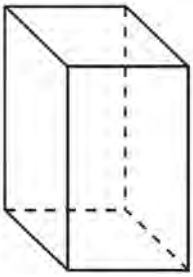
If $AD = 24$, $DB = 12$, and $DE = 4$, what is the length of $\overline{AC}$?
1) 8
2) 12
3) 16
4) 72

211 A student has a rectangular postcard that he folds in half lengthwise. Next, he rotates it continuously about the folded edge. Which three-dimensional object below is generated by this rotation?

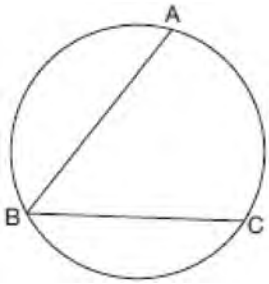
1) 

2) 

3) 

4) 

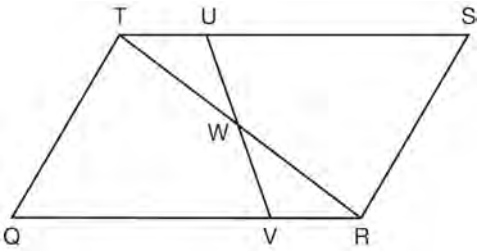
212 In the diagram below, $\overset{\frown}{mABC} = 268°$.



What is the number of degrees in the measure of $\angle ABC$?

1) 134º
2) 92º
3) 68º
4) 46º

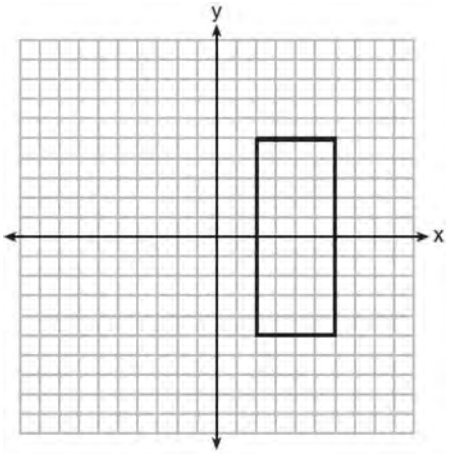
213 In parallelogram $QRST$ shown below, diagonal $\overline{TR}$ is drawn, U and V are points on $\overline{TS}$ and $\overline{QR}$, respectively, and $\overline{UV}$ intersects $\overline{TR}$ at W.



If $m\angle S = 60°$, $m\angle SRT = 83°$, and $m\angle TWU = 35°$, what is $m\angle WVQ$?

1) 37º
2) 60º
3) 72º
4) 83º

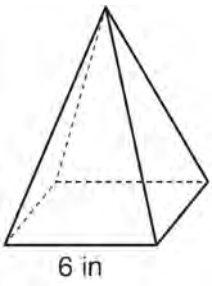
214 As shown in the graph below, the quadrilateral is a rectangle.



Which transformation would *not* map the rectangle onto itself?

1) a reflection over the *x*-axis
2) a reflection over the line $x = 4$
3) a rotation of 180° about the origin
4) a rotation of 180° about the point (4,0)

215 As shown in the diagram below, a regular pyramid has a square base whose side measures 6 inches.



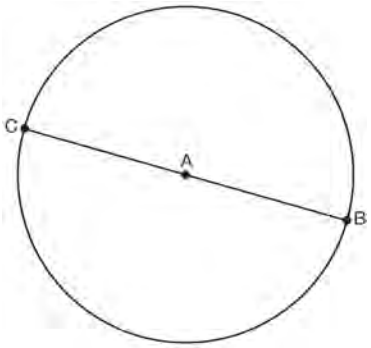
If the altitude of the pyramid measures 12 inches, its volume, in cubic inches, is

1) 72
2) 144
3) 288
4) 432

216 An equilateral triangle has sides of length 20. To the *nearest tenth*, what is the height of the equilateral triangle?

1) 10.0
2) 11.5
3) 17.3
4) 23.1

217 In the diagram below, $\overline{BC}$ is the diameter of circle *A*.



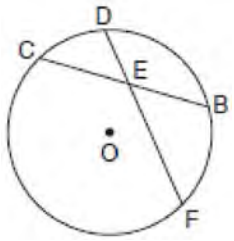
Point *D*, which is unique from points *B* and *C*, is plotted on circle *A*. Which statement must always be true?

1) $\triangle BCD$ is a right triangle.
2) $\triangle BCD$ is an isosceles triangle.
3) $\triangle BAD$ and $\triangle CBD$ are similar triangles.
4) $\triangle BAD$ and $\triangle CAD$ are congruent triangles.

218 A hemispherical tank is filled with water and has a diameter of 10 feet. If water weighs 62.4 pounds per cubic foot, what is the total weight of the water in a full tank, to the *nearest pound*?

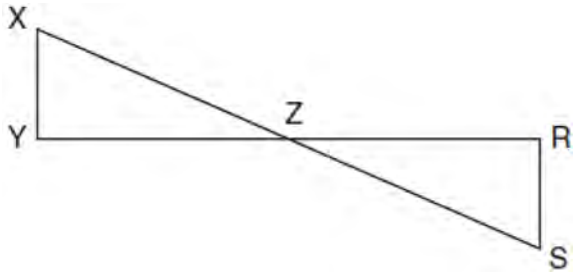
1) 16,336
2) 32,673
3) 130,690
4) 261,381

219 In the diagram below of circle O, chord $\overline{DF}$ bisects chord $\overline{BC}$ at E.



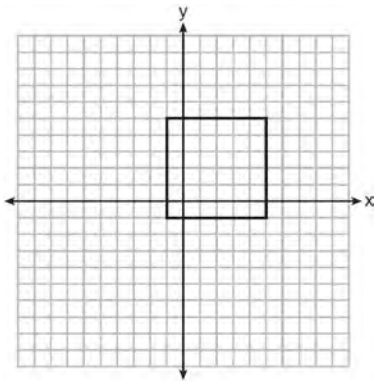
If $BC = 12$ and FE is 5 more than DE, then FE is
1) 13
2) 9
3) 6
4) 4

220 In the diagram below, $\overline{XS}$ and $\overline{YR}$ intersect at Z. Segments XY and RS are drawn perpendicular to $\overline{YR}$ to form triangles XYZ and SRZ.



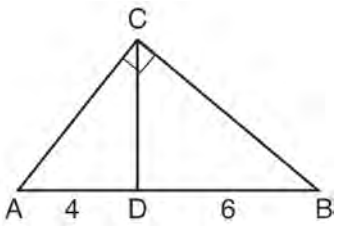
Which statement is always true?
1) $(XY)(SR) = (XZ)(RZ)$
2) $\triangle XYZ \cong \triangle SRZ$
3) $\overline{XS} \cong \overline{YR}$
4) $\frac{XY}{SR} = \frac{YZ}{RZ}$

221 In the diagram below, a square is graphed in the coordinate plane.



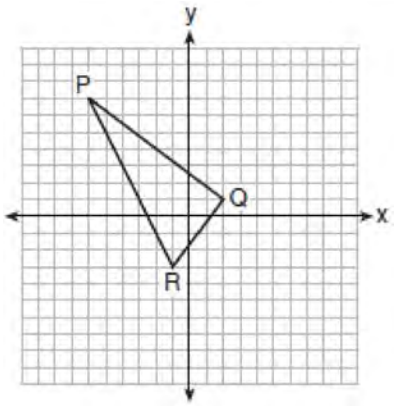
A reflection over which line does *not* carry the square onto itself?
1) $x = 5$
2) $y = 2$
3) $y = x$
4) $x + y = 4$

222 In the diagram of right triangle ABC, $\overline{CD}$ intersects hypotenuse $\overline{AB}$ at D.



If $AD = 4$ and $DB = 6$, which length of $\overline{AC}$ makes $\overline{CD} \perp \overline{AB}$?
1) $2\sqrt{6}$
2) $2\sqrt{10}$
3) $2\sqrt{15}$
4) $4\sqrt{2}$

223 On the set of axes below, the vertices of $\triangle PQR$ have coordinates $P(-6,7)$, $Q(2,1)$, and $R(-1,-3)$.

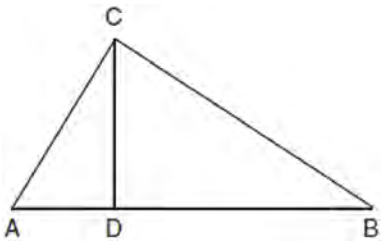


What is the area of $\triangle PQR$?

1) 10
2) 20
3) 25
4) 50

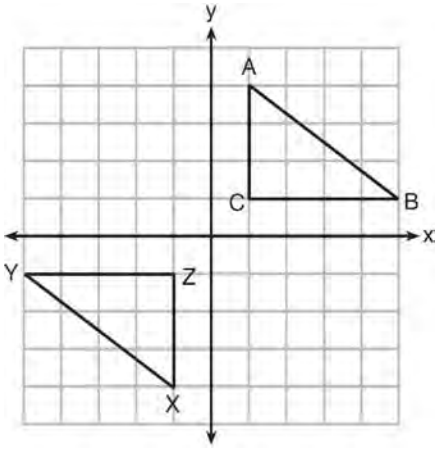
Geometry Common Core State Standards 2 Point Regents Exam Questions

224 In right triangle ABC shown below, altitude $\overline{CD}$ is drawn to hypotenuse $\overline{AB}$. Explain why $\triangle ABC \sim \triangle ACD$.



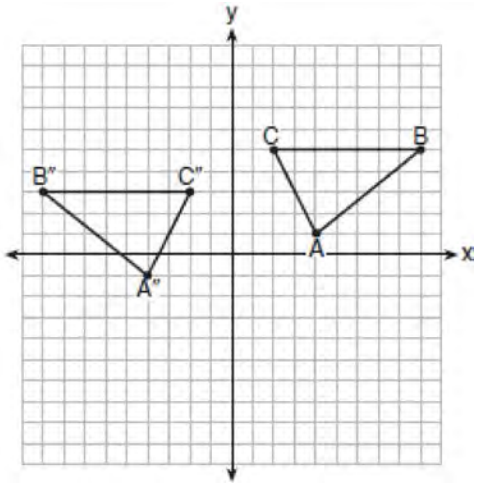
225 Line ℓ is mapped onto line m by a dilation centered at the origin with a scale factor of 2. The equation of line ℓ is $3x - y = 4$. Determine and state an equation for line m.

226 In the diagram below, $\triangle ABC$ and $\triangle XYZ$ are graphed.



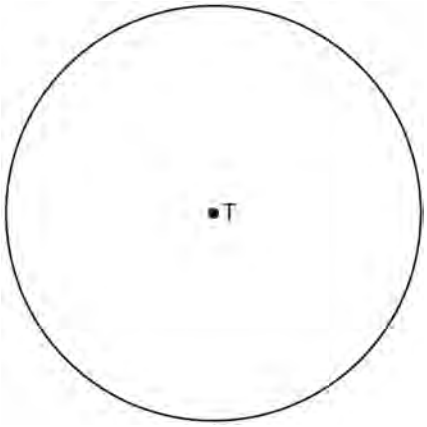
Use the properties of rigid motions to explain why $\triangle ABC \cong \triangle XYZ$.

227 The graph below shows $\triangle ABC$ and its image, $\triangle A''B''C''$.

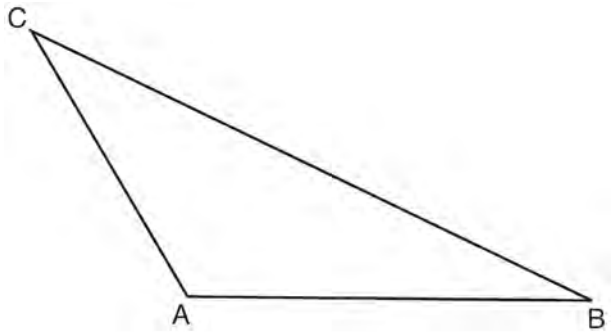


Describe a sequence of rigid motions which would map $\triangle ABC$ onto $\triangle A''B''C''$.

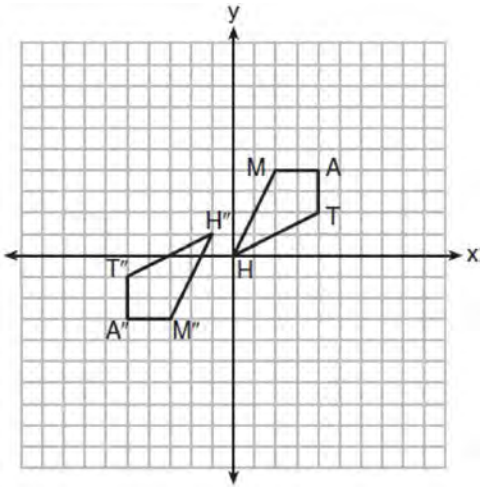
228 Use a compass and straightedge to construct an inscribed square in circle T shown below. [Leave all construction marks.]



229 In the diagram of $\triangle ABC$ shown below, use a compass and straightedge to construct the median to $\overline{AB}$. [Leave all construction marks.]

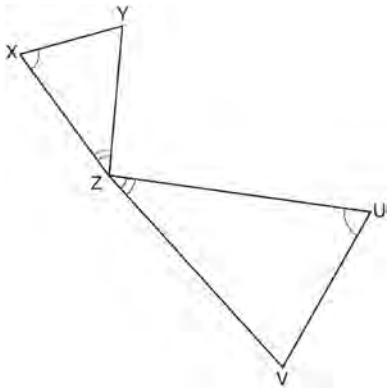


230 Quadrilateral *MATH* and its image *M"A"T"H"* are graphed on the set of axes below.



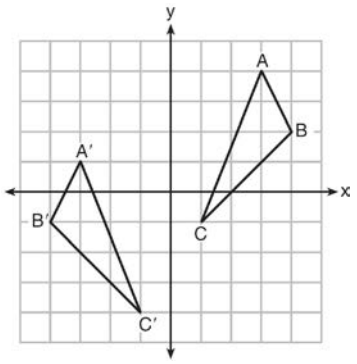
Describe a sequence of transformations that maps quadrilateral *MATH* onto quadrilateral *M"A"T"H"*.

231 In the diagram below, triangles *XYZ* and *UVZ* are drawn such that $\angle X \cong \angle U$ and $\angle XZY \cong \angle UZV$.



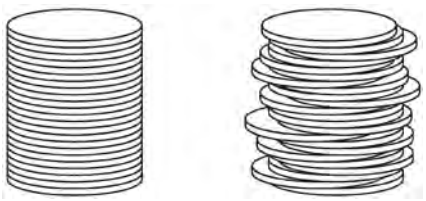
Describe a sequence of similarity transformations that shows $\triangle XYZ$ is similar to $\triangle UVZ$.

232 As graphed on the set of axes below, $\triangle A'B'C'$ is the image of $\triangle ABC$ after a sequence of transformations.



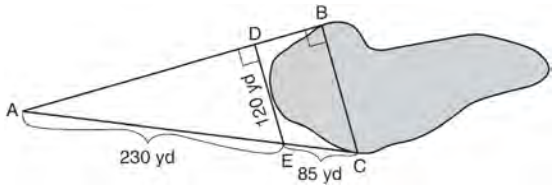
Is $\triangle A'B'C'$ congruent to $\triangle ABC$? Use the properties of rigid motion to explain your answer.

233 Two stacks of 23 quarters each are shown below. One stack forms a cylinder but the other stack does not form a cylinder.



Use Cavelieri's principle to explain why the volumes of these two stacks of quarters are equal.

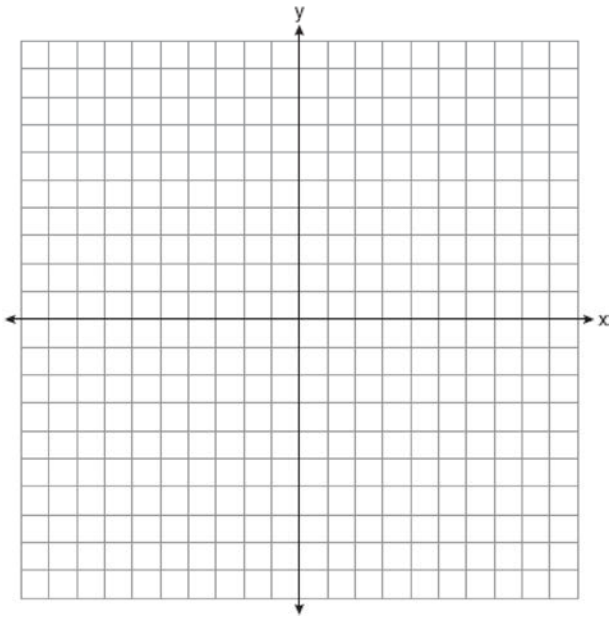
234 To find the distance across a pond from point *B* to point *C*, a surveyor drew the diagram below. The measurements he made are indicated on his diagram.



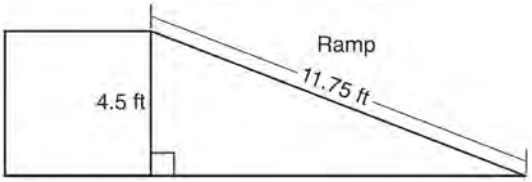
Use the surveyor's information to determine and state the distance from point *B* to point *C*, to the *nearest yard*.

235 Point *P* is on segment *AB* such that $AP:PB$ is $4:5$. If *A* has coordinates $(4,2)$, and *B* has coordinates $(22,2)$, determine and state the coordinates of *P*.

236 In square *GEOM*, the coordinates of *G* are $(2,-2)$ and the coordinates of *O* are $(-4,2)$. Determine and state the coordinates of vertices *E* and *M*. [The use of the set of axes below is optional.]



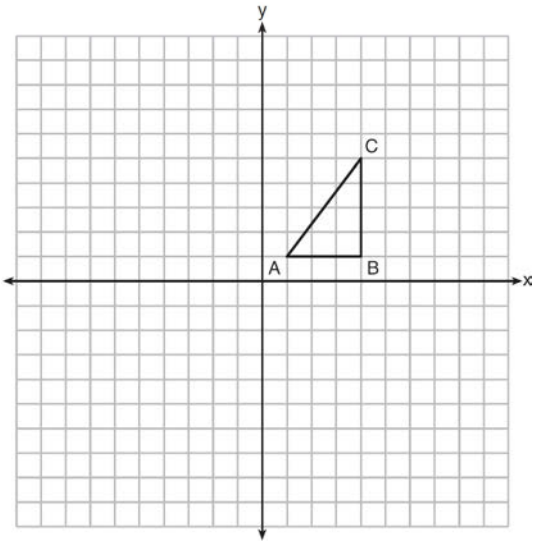
237 The diagram below shows a ramp connecting the ground to a loading platform 4.5 feet above the ground. The ramp measures 11.75 feet from the ground to the top of the loading platform.



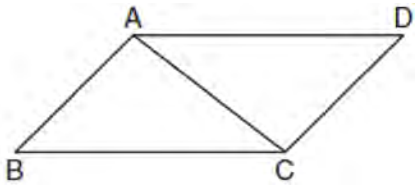
Determine and state, to the *nearest degree*, the angle of elevation formed by the ramp and the ground.

238 A machinist creates a solid steel part for a wind turbine engine. The part has a volume of 1015 cubic centimeters. Steel can be purchased for \$0.29 per kilogram, and has a density of 7.95 g/cm^3. If the machinist makes 500 of these parts, what is the cost of the steel, to the *nearest dollar*?

239 In the diagram below, $\triangle ABC$ has coordinates $A(1,1)$, $B(4,1)$, and $C(4,5)$. Graph and label $\triangle A''B''C''$, the image of $\triangle ABC$ after the translation five units to the right and two units up followed by the reflection over the line $y = 0$.

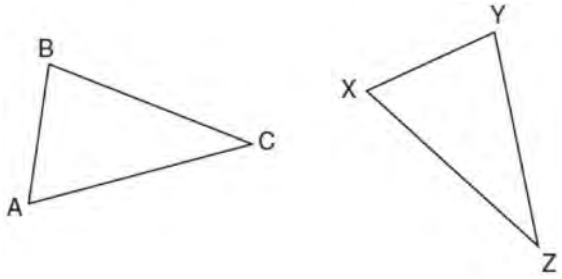


240 Given: Parallelogram $ABCD$ with diagonal $\overline{AC}$ drawn



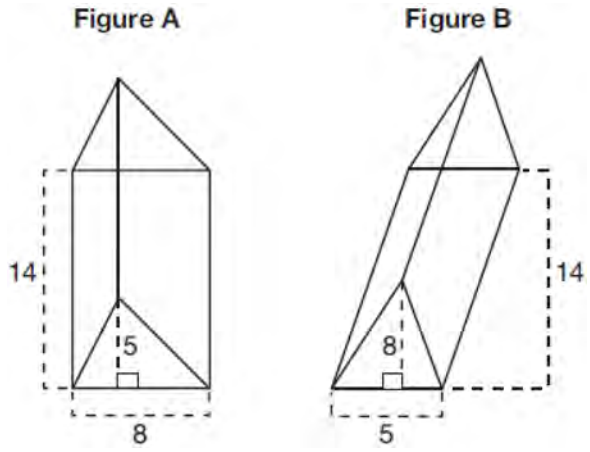
Prove: $\triangle ABC \cong \triangle CDA$

241 In the diagram below of $\triangle ABC$ and $\triangle XYZ$, a sequence of rigid motions maps $\angle A$ onto $\angle X$, $\angle C$ onto $\angle Z$, and $\overline{AC}$ onto $\overline{XZ}$.



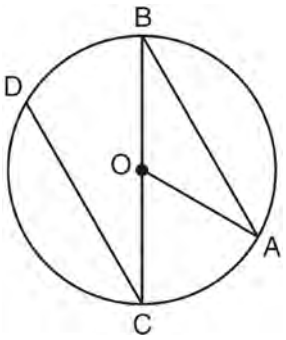
Determine and state whether $\overline{BC} \cong \overline{YZ}$. Explain why.

242 The diagram below shows two figures. Figure A is a right triangular prism and figure B is an oblique triangular prism. The base of figure A has a height of 5 and a length of 8 and the height of prism A is 14. The base of figure B has a height of 8 and a length of 5 and the height of prism B is 14.



Use Cavalieri's Principle to explain why the volumes of these two triangular prisms are equal.

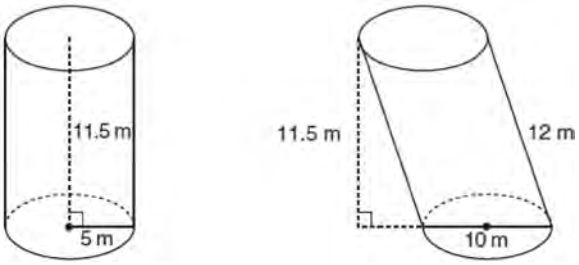
243 In the diagram below of circle O with diameter $\overline{BC}$ and radius $\overline{OA}$, chord $\overline{DC}$ is parallel to chord $\overline{BA}$.



If $m\angle BCD = 30°$, determine and state $m\angle AOB$.

244 Given: Right triangle ABC with right angle at C. If $\sin A$ increases, does $\cos B$ increase or decrease? Explain why.

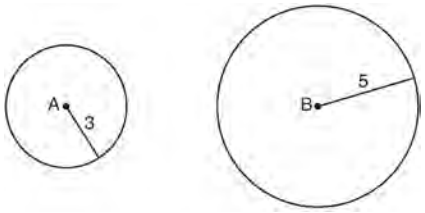
245 Sue believes that the two cylinders shown in the diagram below have equal volumes.



Is Sue correct? Explain why.

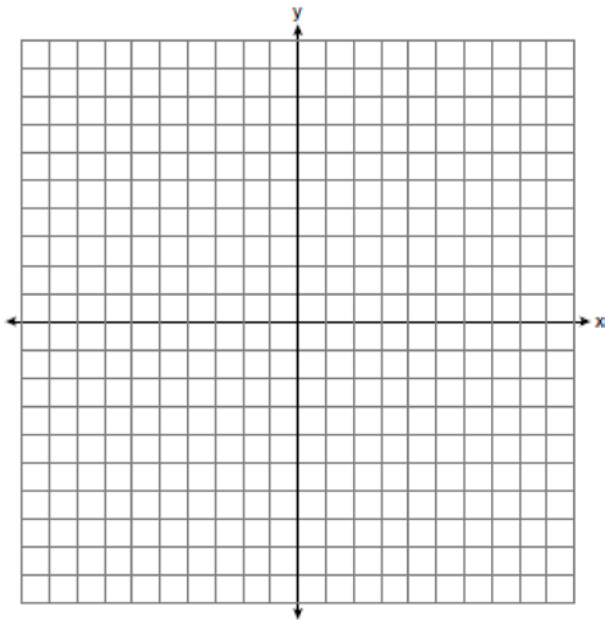
246 Determine and state the coordinates of the center and the length of the radius of a circle whose equation is $x^2 + y^2 - 6x = 56 - 8y$.

247 As shown in the diagram below, circle A has a radius of 3 and circle B has a radius of 5.

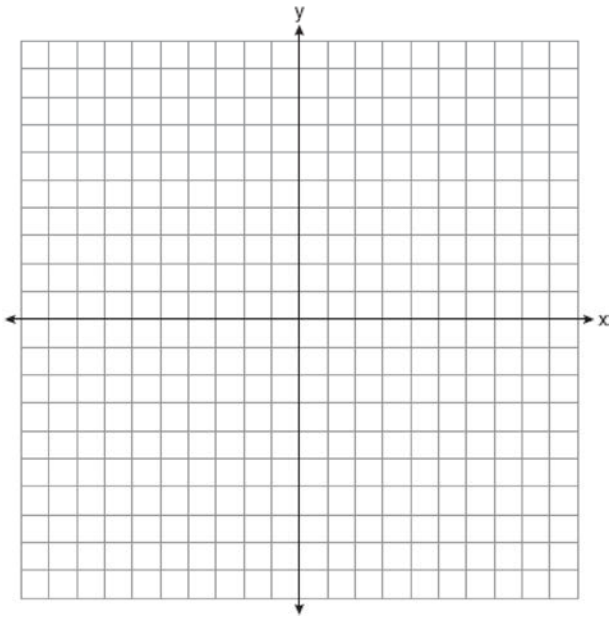


Use transformations to explain why circles A and B are similar.

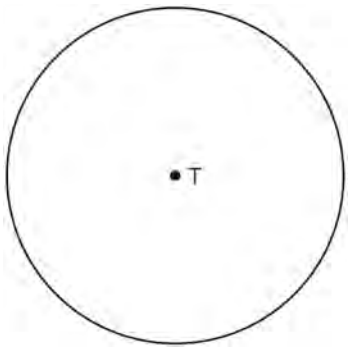
248 The coordinates of the endpoints of $\overline{AB}$ are $A(-6,-5)$ and $B(4,0)$. Point P is on $\overline{AB}$. Determine and state the coordinates of point P, such that $AP:PB$ is $2:3$. [The use of the set of axes below is optional.]



249 The coordinates of the endpoints of $\overline{AB}$ are $A(2,3)$ and $B(5,-1)$. Determine the length of $\overline{A'B'}$, the image of $\overline{AB}$, after a dilation of $\frac{1}{2}$ centered at the origin. [The use of the set of axes below is optional.]

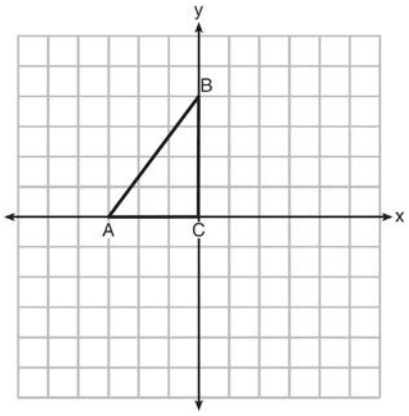


250 Construct an equilateral triangle inscribed in circle T shown below. [Leave all construction marks.]

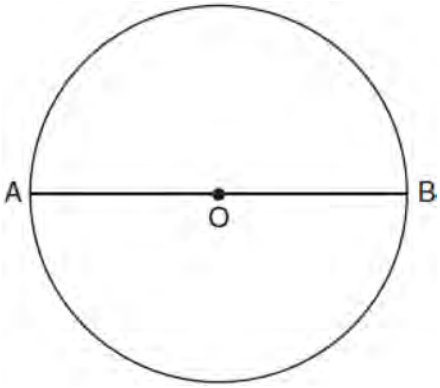


251 Determine and state, in terms of π, the area of a sector that intercepts a 40° arc of a circle with a radius of 4.5.

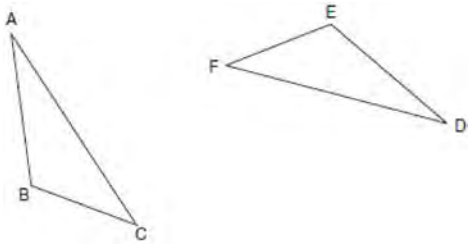
252 Triangle ABC is graphed on the set of axes below. Graph and label $\triangle A'B'C'$, the image of $\triangle ABC$ after a reflection over the line $x = 1$.



253 The diagram below shows circle O with diameter $\overline{AB}$. Using a compass and straightedge, construct a square that is inscribed in circle O. [Leave all construction marks.]

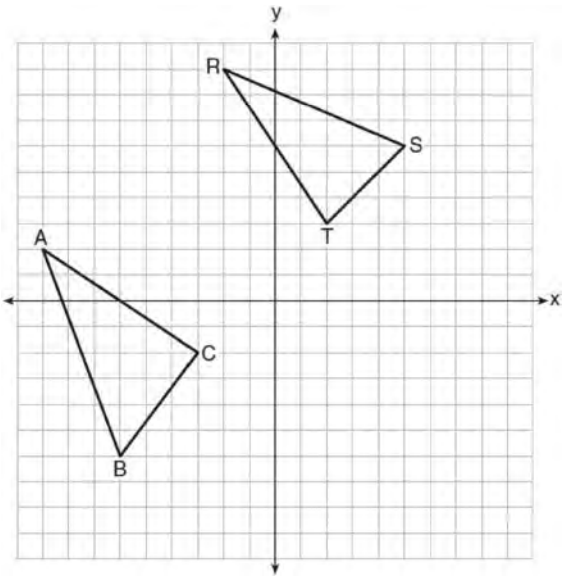


254 Triangle *ABC* and triangle *DEF* are drawn below.



If $\overline{AB} \cong \overline{DE}$, $\overline{AC} \cong \overline{DF}$, and $\angle A \cong \angle D$, write a sequence of transformations that maps triangle *ABC* onto triangle *DEF*.

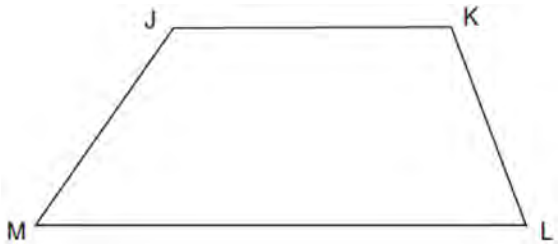
255 In the graph below, $\triangle ABC$ has coordinates $A(-9,2)$, $B(-6,-6)$, and $C(-3,-2)$, and $\triangle RST$ has coordinates $R(-2,9)$, $S(5,6)$, and $T(2,3)$.



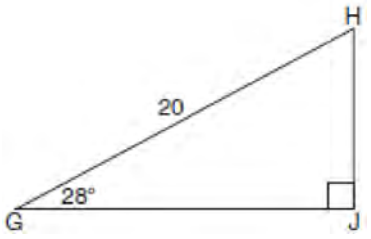
Is $\triangle ABC$ congruent to $\triangle RST$? Use the properties of rigid motions to explain your reasoning.

256 The endpoints of $\overline{DEF}$ are $D(1,4)$ and $F(16,14)$. Determine and state the coordinates of point *E*, if $DE:EF = 2:3$.

257 Given: Trapezoid *JKLM* with $\overline{JK} \parallel \overline{ML}$
Using a compass and straightedge, construct the altitude from vertex *J* to $\overline{ML}$. [Leave all construction marks.]



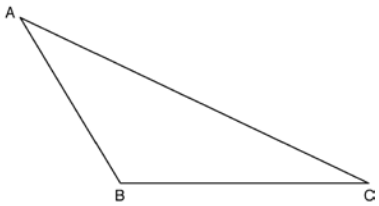
258 When instructed to find the length of $\overline{HJ}$ in right triangle *HJG*, Alex wrote the equation $\sin 28° = \frac{HJ}{20}$ while Marlene wrote $\cos 62° = \frac{HJ}{20}$. Are both students' equations correct? Explain why.



259 Find the value of *R* that will make the equation $\sin 73° = \cos R$ true when $0° < R < 90°$. Explain your answer.

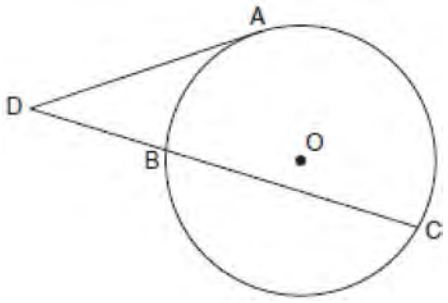
260 In isosceles $\triangle MNP$, line segment NO bisects vertex $\angle MNP$, as shown below. If $MP = 16$, find the length of $\overline{MO}$ and explain your answer.

261 Using a compass and straightedge, construct an altitude of triangle ABC below. [Leave all construction marks.]



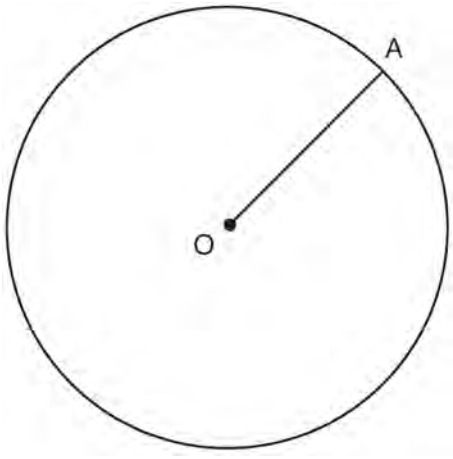
262 A flagpole casts a shadow 16.60 meters long. Tim stands at a distance of 12.45 meters from the base of the flagpole, such that the end of Tim's shadow meets the end of the flagpole's shadow. If Tim is 1.65 meters tall, determine and state the height of the flagpole to the *nearest tenth of a meter*.

263 In the diagram below, tangent $\overline{DA}$ and secant $\overline{DBC}$ are drawn to circle O from external point D, such that $\overset{\frown}{AC} \cong \overset{\frown}{BC}$.



If $m\overset{\frown}{BC} = 152°$, determine and state $m\angle D$.

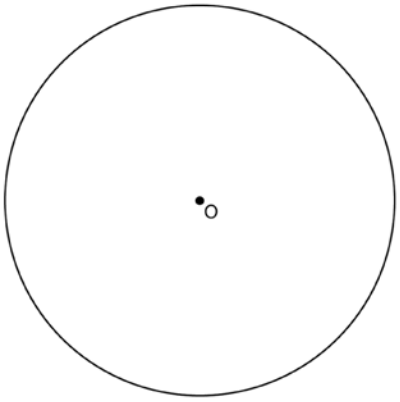
264 In the diagram below, radius $\overline{OA}$ is drawn in circle O. Using a compass and a straightedge, construct a line tangent to circle O at point A. [Leave all construction marks.]



265 Bob places an 18-foot ladder 6 feet from the base of his house and leans it up against the side of his house. Find, to the *nearest degree*, the measure of the angle the bottom of the ladder makes with the ground.

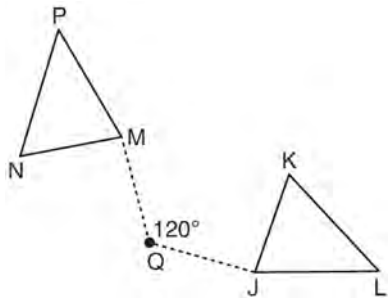
266 When volleyballs are purchased, they are not fully inflated. A partially inflated volleyball can be modeled by a sphere whose volume is approximately 180 in^3. After being fully inflated, its volume is approximately 294 in^3. To the *nearest tenth of an inch*, how much does the radius increase when the volleyball is fully inflated?

267 Using a compass and straightedge, construct a regular hexagon inscribed in circle *O*. [Leave all construction marks.]

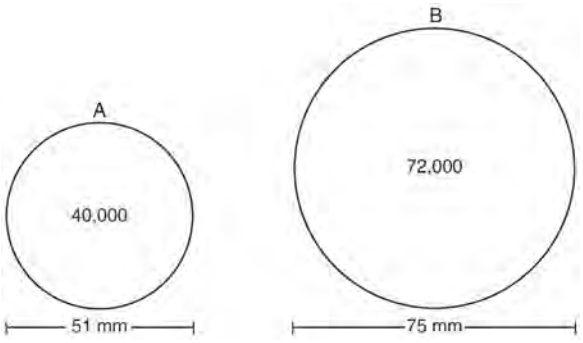


268 A contractor needs to purchase 500 bricks. The dimensions of each brick are 5.1 cm by 10.2 cm by 20.3 cm, and the density of each brick is $1920\ kg/m^3$. The maximum capacity of the contractor's trailer is 900 kg. Can the trailer hold the weight of 500 bricks? Justify your answer.

269 Triangle *MNP* is the image of triangle *JKL* after a 120° counterclockwise rotation about point *Q*. If the measure of angle *L* is 47° and the measure of angle *N* is 57°, determine the measure of angle *M*. Explain how you arrived at your answer.

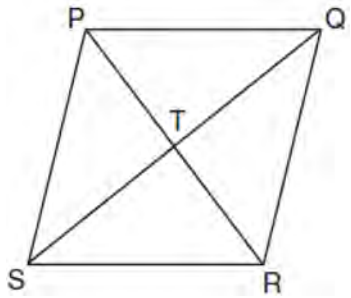


270 During an experiment, the same type of bacteria is grown in two petri dishes. Petri dish *A* has a diameter of 51 mm and has approximately 40,000 bacteria after 1 hour. Petri dish *B* has a diameter of 75 mm and has approximately 72,000 bacteria after 1 hour.

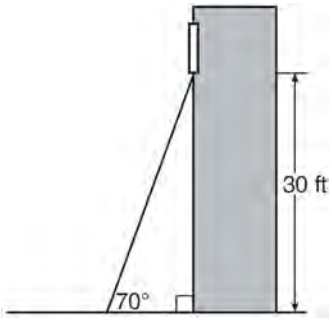


Determine and state which petri dish has the greater population density of bacteria at the end of the first hour.

271 In the diagram of rhombus *PQRS* below, the diagonals $\overline{PR}$ and $\overline{QS}$ intersect at point *T*, *PR* = 16, and *QS* = 30. Determine and state the perimeter of *PQRS*.

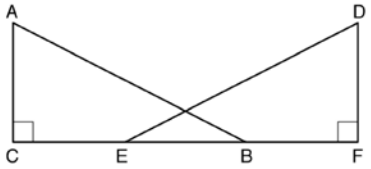


272 A carpenter leans an extension ladder against a house to reach the bottom of a window 30 feet above the ground. As shown in the diagram below, the ladder makes a 70° angle with the ground. To the *nearest foot*, determine and state the length of the ladder.

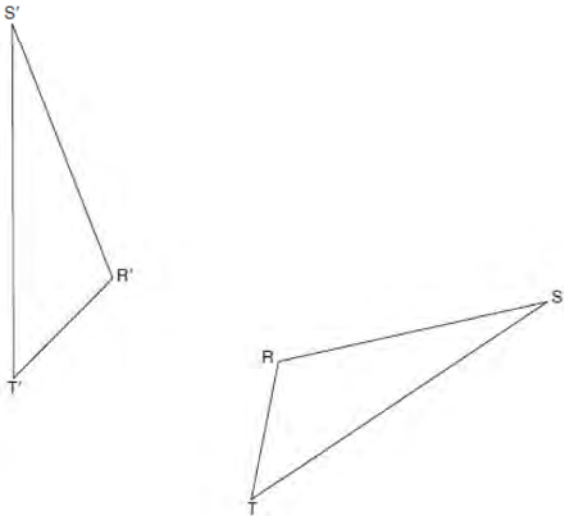


273 A ladder leans against a building. The top of the ladder touches the building 10 feet above the ground. The foot of the ladder is 4 feet from the building. Find, to the *nearest degree*, the angle that the ladder makes with the level ground.

274 Given right triangles *ABC* and *DEF* where $\angle C$ and $\angle F$ are right angles, $\overline{AC} \cong \overline{DF}$ and $\overline{CB} \cong \overline{FE}$. Describe a precise sequence of rigid motions which would show $\triangle ABC \cong \triangle DEF$.



275 Using a compass and straightedge, construct the line of reflection over which triangle *RST* reflects onto triangle *R'S'T'*. [Leave all construction marks.]

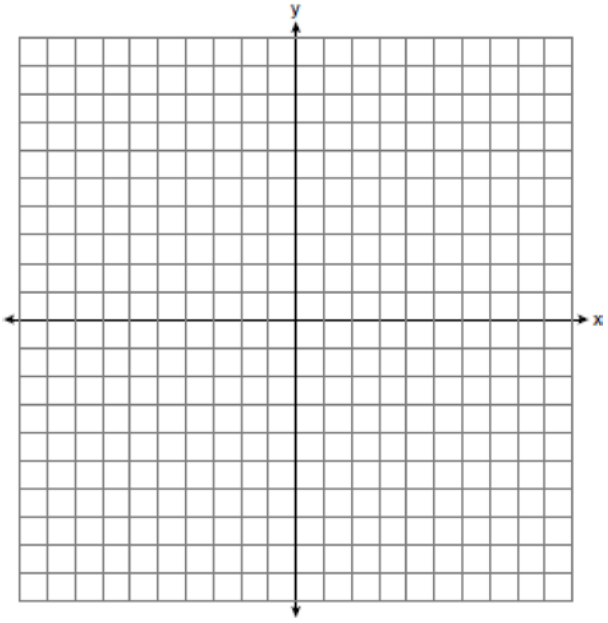


276 After a reflection over a line, $\triangle A'B'C'$ is the image of $\triangle ABC$. Explain why triangle *ABC* is congruent to triangle $\triangle A'B'C'$.

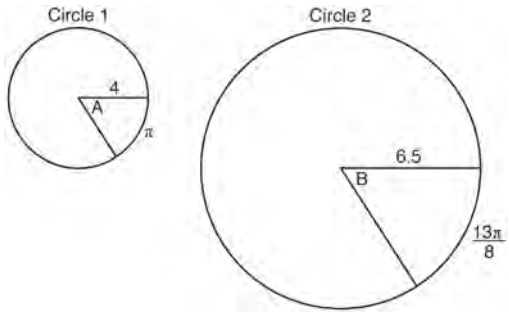
277 A wooden cube has an edge length of 6 centimeters and a mass of 137.8 grams. Determine the density of the cube, to the *nearest thousandth*. State which type of wood the cube is made of, using the density table below.

Type of Wood	**Density** (g/cm^3)
Pine	0.373
Hemlock	0.431
Elm	0.554
Birch	0.601
Ash	0.638
Maple	0.676
Oak	0.711

278 Directed line segment PT has endpoints whose coordinates are $P(-2,1)$ and $T(4,7)$. Determine the coordinates of point J that divides the segment in the ratio 2 to 1. [The use of the set of axes below is optional.]



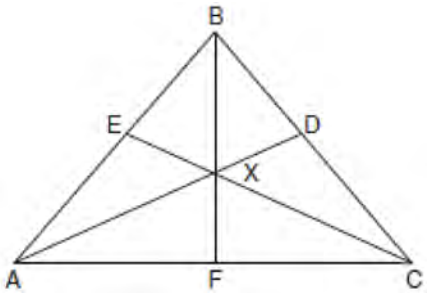
279 In the diagram below, Circle 1 has radius 4, while Circle 2 has radius 6.5. Angle A intercepts an arc of length π, and angle B intercepts an arc of length $\frac{13\pi}{8}$.



Dominic thinks that angles A and B have the same radian measure. State whether Dominic is correct or not. Explain why.

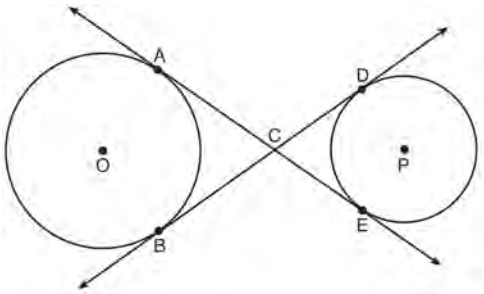
280 A regular hexagon is rotated in a counterclockwise direction about its center. Determine and state the minimum number of degrees in the rotation such that the hexagon will coincide with itself.

281 In the diagram below of isosceles triangle ABC, $\overline{AB} \cong \overline{CB}$ and angle bisectors $\overline{AD}$, $\overline{BF}$, and $\overline{CE}$ are drawn and intersect at X.



If $m\angle BAC = 50°$, find $m\angle AXC$.

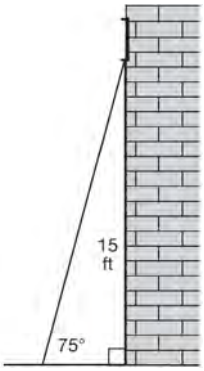
282 Lines AE and BD are tangent to circles O and P at A, E, B, and D, as shown in the diagram below. If $AC:CE = 5:3$, and $BD = 56$, determine and state the length of $\overline{CD}$.



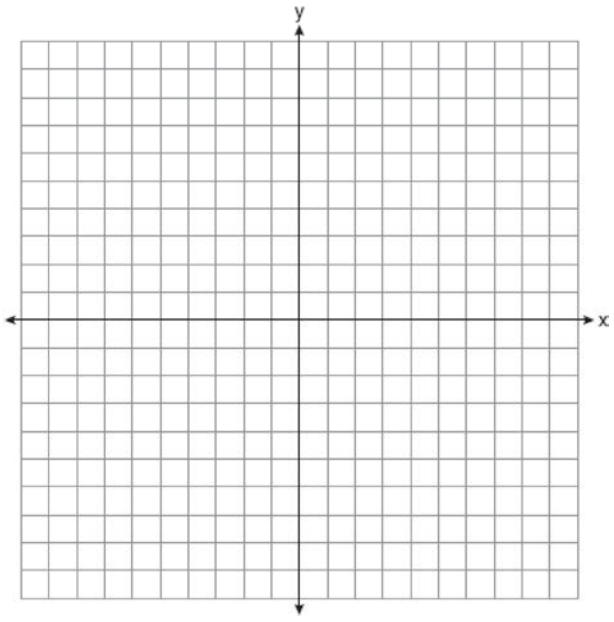
283 A circle has a center at $(1,-2)$ and radius of 4. Does the point $(3.4, 1.2)$ lie on the circle? Justify your answer.

284 In right triangle ABC with the right angle at C, $\sin A = 2x + 0.1$ and $\cos B = 4x - 0.7$. Determine and state the value of x. Explain your answer.

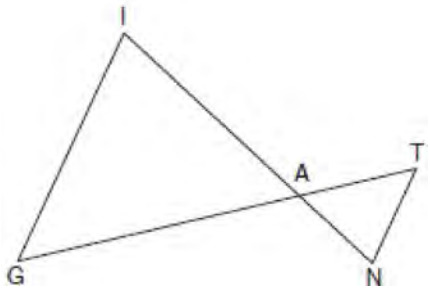
285 In the diagram below, a window of a house is 15 feet above the ground. A ladder is placed against the house with its base at an angle of 75° with the ground. Determine and state the length of the ladder to the *nearest tenth of a foot*.



286 Line n is represented by the equation $3x + 4y = 20$. Determine and state the equation of line p, the image of line n, after a dilation of scale factor $\frac{1}{3}$ centered at the point $(4,2)$. [The use of the set of axes below is optional.] Explain your answer.

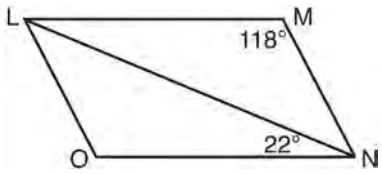


287 In the diagram below, $\overline{GI}$ is parallel to $\overline{NT}$, and $\overline{IN}$ intersects $\overline{GT}$ at A.



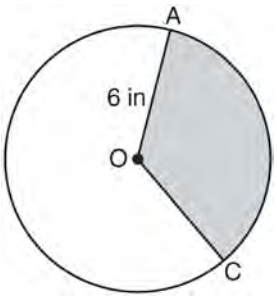
Prove: $\triangle GIA \sim \triangle TNA$

288 The diagram below shows parallelogram $LMNO$ with diagonal $\overline{LN}$, $m\angle M = 118°$, and $m\angle LNO = 22°$.

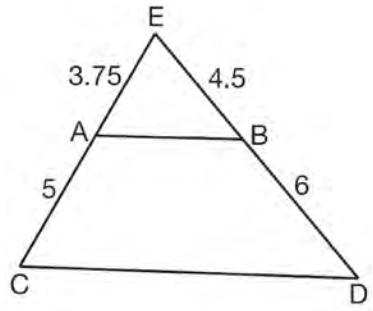


Explain why $m\angle NLO$ is 40 degrees.

289 In the diagram below of circle O, the area of the shaded sector AOC is 12π in^2 and the length of $\overline{OA}$ is 6 inches. Determine and state $m\angle AOC$.

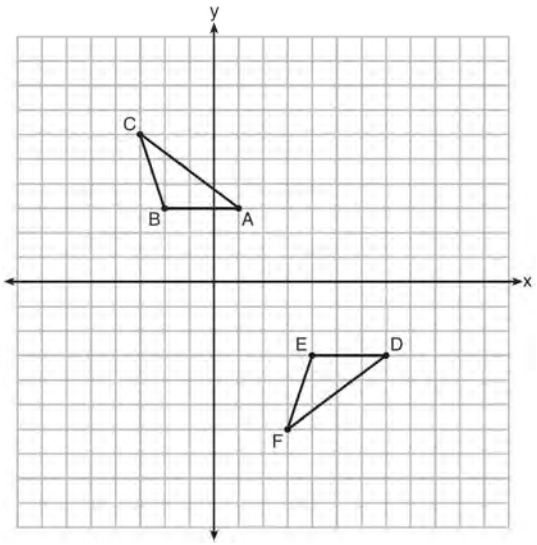


290 In $\triangle CED$ as shown below, points A and B are located on sides $\overline{CE}$ and $\overline{ED}$, respectively. Line segment AB is drawn such that $AE = 3.75$, $AC = 5$, $EB = 4.5$, and $BD = 6$.



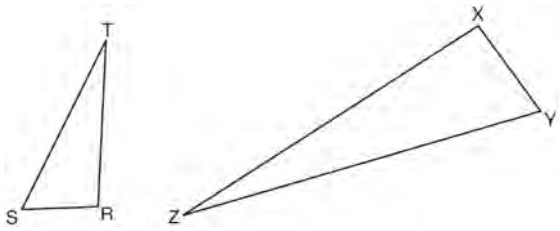
Explain why $\overline{AB}$ is parallel to $\overline{CD}$.

291 Describe a sequence of transformations that will map $\triangle ABC$ onto $\triangle DEF$ as shown below.

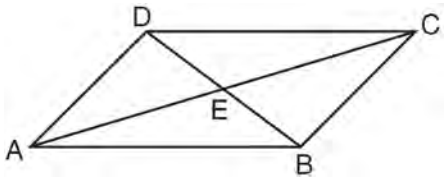


292 Explain why $\cos(x) = \sin(90 - x)$ for x such that $0 < x < 90$.

293 Triangles *RST* and *XYZ* are drawn below. If $RS = 6$, $ST = 14$, $XY = 9$, $YZ = 21$, and $\angle S \cong \angle Y$, is $\triangle RST$ similar to $\triangle XYZ$? Justify your answer.

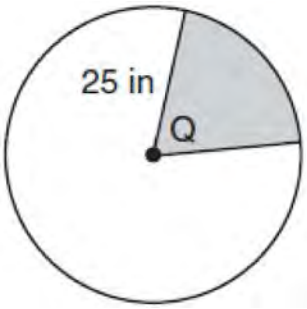


294 In parallelogram *ABCD* shown below, diagonals $\overline{AC}$ and $\overline{BD}$ intersect at *E*.



Prove: $\angle ACD \cong \angle CAB$

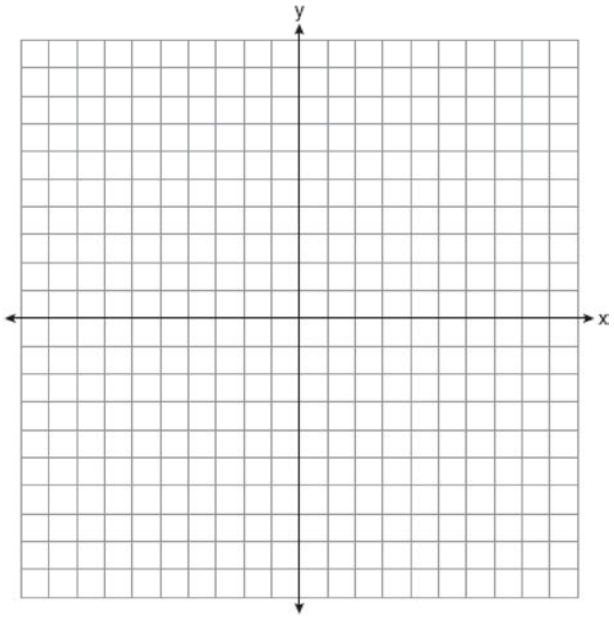
295 In the diagram below, the circle has a radius of 25 inches. The area of the *unshaded* sector is 500π in^2.



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

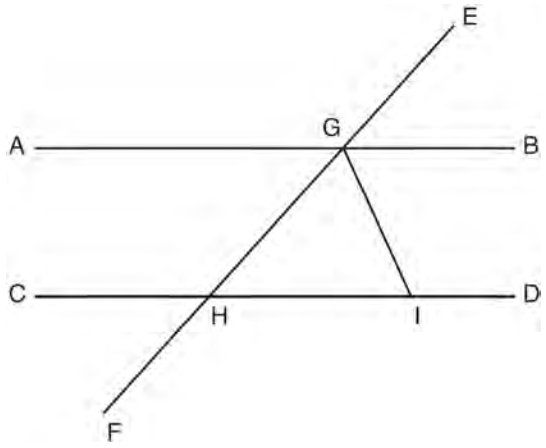
Geometry Common Core State Standards 4 Point Regents Exam Questions

296 Triangle ABC has vertices at $A(-5,2)$, $B(-4,7)$, and $C(-2,7)$, and triangle DEF has vertices at $D(3,2)$, $E(2,7)$, and $F(0,7)$. Graph and label $\triangle ABC$ and $\triangle DEF$ on the set of axes below. Determine and state the single transformation where $\triangle DEF$ is the image of $\triangle ABC$. Use your transformation to explain why $\triangle ABC \cong \triangle DEF$.



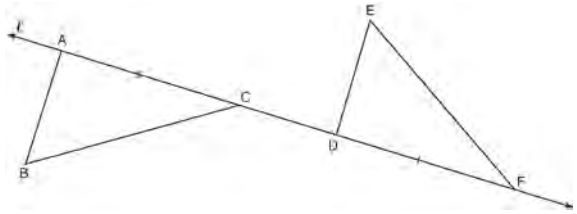
297 Trees that are cut down and stripped of their branches for timber are approximately cylindrical. A timber company specializes in a certain type of tree that has a typical diameter of 50 cm and a typical height of about 10 meters. The density of the wood is 380 kilograms per cubic meter, and the wood can be sold by mass at a rate of \$4.75 per kilogram. Determine and state the minimum number of whole trees that must be sold to raise at least \$50,000.

298 In the diagram below, $\overline{EF}$ intersects $\overline{AB}$ and $\overline{CD}$ at G and H, respectively, and $\overline{GI}$ is drawn such that $\overline{GH} \cong \overline{IH}$.



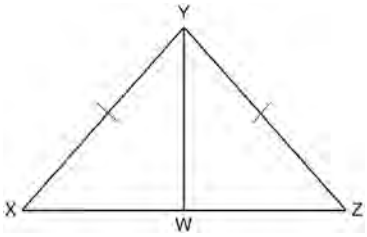
If m$\angle EGB = 50°$ and m$\angle DIG = 115°$, explain why $\overline{AB} \parallel \overline{CD}$.

299 In the diagram below, $\overline{AC} \cong \overline{DF}$ and points A, C, D, and F are collinear on line ℓ.

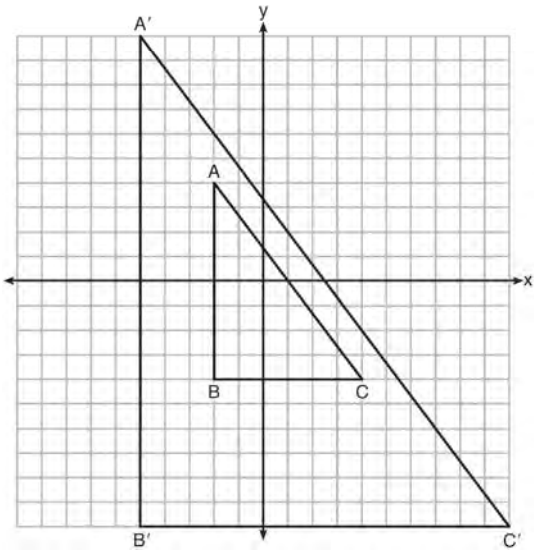


Let $\triangle D'E'F'$ be the image of $\triangle DEF$ after a translation along ℓ, such that point D is mapped onto point A. Determine and state the location of F'. Explain your answer. Let $\triangle D''E''F''$ be the image of $\triangle D'E'F'$ after a reflection across line ℓ. Suppose that E'' is located at B. Is $\triangle DEF$ congruent to $\triangle ABC$? Explain your answer.

300 Given: $\triangle XYZ$, $\overline{XY} \cong \overline{ZY}$, and $\overline{YW}$ bisects $\angle XYZ$
Prove that $\angle YWZ$ is a right angle.

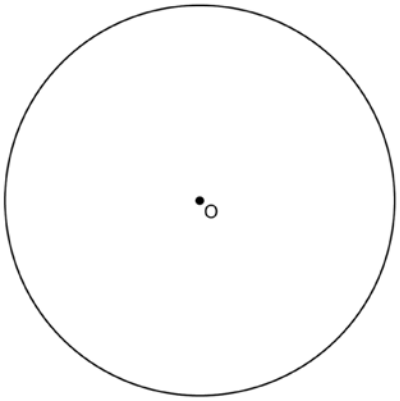


301 In the diagram below, $\triangle A'B'C'$ is the image of $\triangle ABC$ after a transformation.



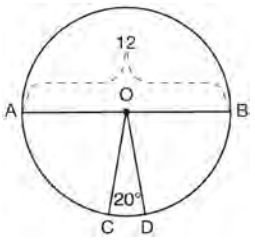
Describe the transformation that was performed.
Explain why $\triangle A'B'C' \sim \triangle ABC$.

302 Using a straightedge and compass, construct a square inscribed in circle O below. [Leave all construction marks.]



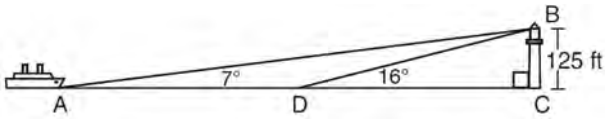
Determine the measure of the arc intercepted by two adjacent sides of the constructed square.
Explain your reasoning.

303 In the diagram below of circle O, diameter $\overline{AB}$ and radii $\overline{OC}$ and $\overline{OD}$ are drawn. The length of $\overline{AB}$ is 12 and the measure of $\angle COD$ is 20 degrees.



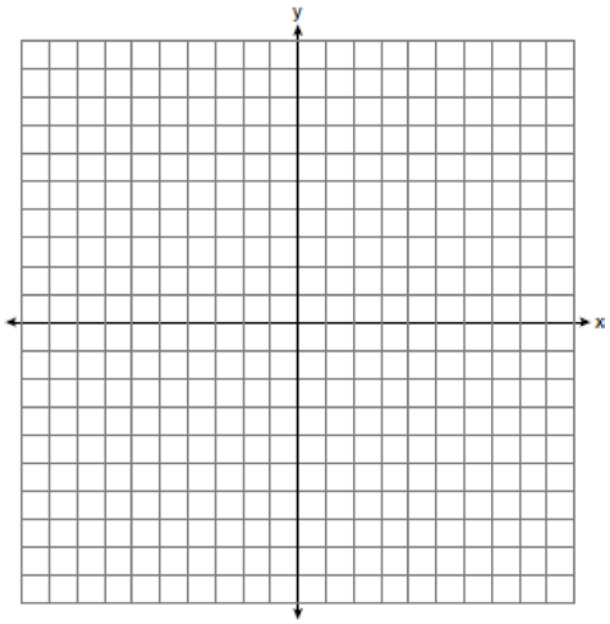
If $\overset{\frown}{AC} \cong \overset{\frown}{BD}$, find the area of sector BOD in terms of π.

304 As shown in the diagram below, a ship is heading directly toward a lighthouse whose beacon is 125 feet above sea level. At the first sighting, point *A*, the angle of elevation from the ship to the light was 7°. A short time later, at point *D*, the angle of elevation was 16°.

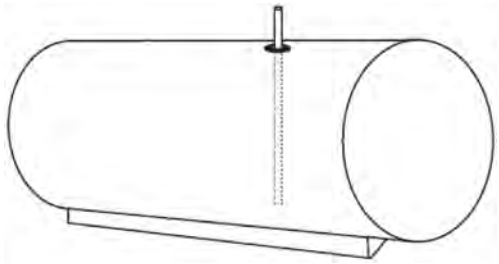


To the *nearest foot*, determine and state how far the ship traveled from point *A* to point *D*.

305 Triangle *ABC* has vertices with $A(x,3)$, $B(-3,-1)$, and $C(-1,-4)$. Determine and state a value of x that would make triangle *ABC* a right triangle. Justify why $\triangle ABC$ is a right triangle. [The use of the set of axes below is optional.]

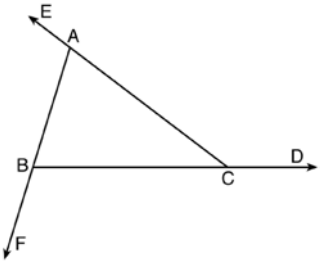


306 A gas station has a cylindrical fueling tank that holds the gasoline for its pumps, as modeled below. The tank holds a maximum of 20,000 gallons of gasoline and has a length of 34.5 feet.



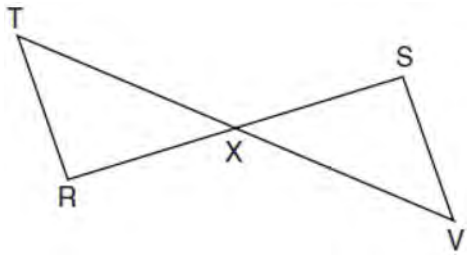
A metal pole is used to measure how much gas is in the tank. To the *nearest tenth of a foot*, how long does the pole need to be in order to reach the bottom of the tank and still extend one foot outside the tank? Justify your answer. [1 ft^3=7.48 gallons]

307 Prove the sum of the exterior angles of a triangle is 360°.



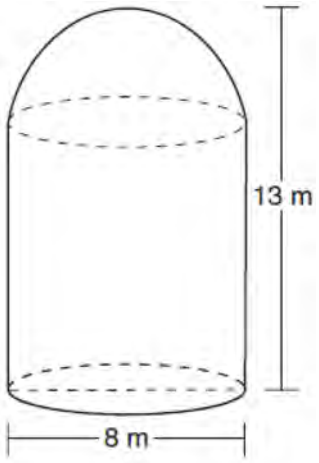
308 A barrel of fuel oil is a right circular cylinder where the inside measurements of the barrel are a diameter of 22.5 inches and a height of 33.5 inches. There are 231 cubic inches in a liquid gallon. Determine and state, to the *nearest tenth*, the gallons of fuel that are in a barrel of fuel oil.

309 Given: $\overline{RS}$ and $\overline{TV}$ bisect each other at point X
$\overline{TR}$ and $\overline{SV}$ are drawn

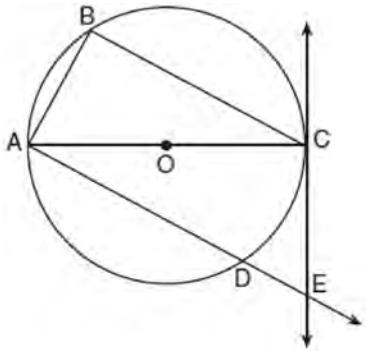


Prove: $\overline{TR} \parallel \overline{SV}$

310 A storage tank is in the shape of a cylinder with a hemisphere on the top. The highest point on the inside of the storage tank is 13 meters above the floor of the storage tank, and the diameter inside the cylinder is 8 meters. Determine and state, to the *nearest cubic meter*, the total volume inside the storage tank.

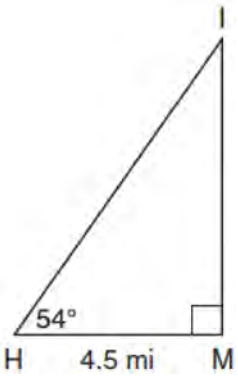


311 In the diagram below of circle O, tangent $\overleftrightarrow{EC}$ is drawn to diameter $\overline{AC}$. Chord $\overline{BC}$ is parallel to secant $\overline{ADE}$, and chord $\overline{AB}$ is drawn.



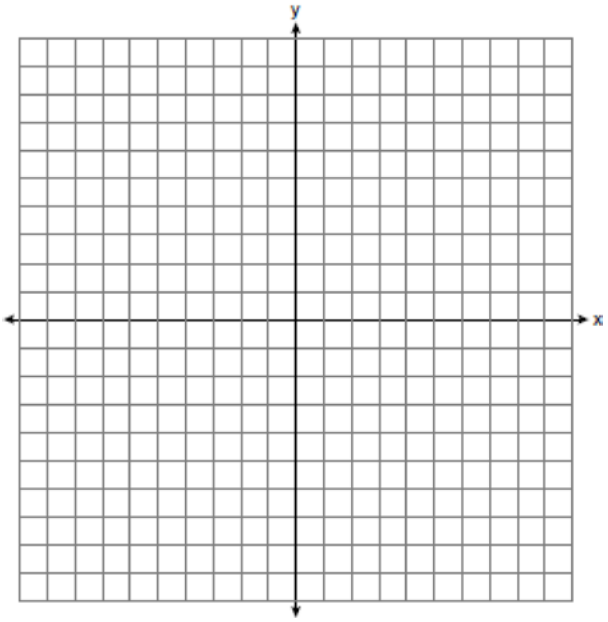
Prove: $\frac{BC}{CA} = \frac{AB}{EC}$

312 As shown in the diagram below, an island (I) is due north of a marina (M). A boat house (H) is 4.5 miles due west of the marina. From the boat house, the island is located at an angle of 54° from the marina.



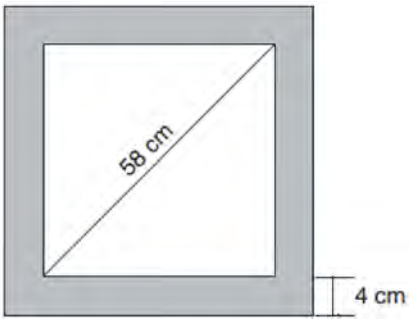
Determine and state, to the *nearest tenth of a mile*, the distance from the boat house (H) to the island (I). Determine and state, to the *nearest tenth of a mile*, the distance from the island (I) to the marina (M).

313 In rhombus *MATH*, the coordinates of the endpoints of the diagonal $\overline{MT}$ are $M(0,-1)$ and $T(4,6)$. Write an equation of the line that contains diagonal $\overline{AH}$. [Use of the set of axes below is optional.] Using the given information, explain how you know that your line contains diagonal $\overline{AH}$.



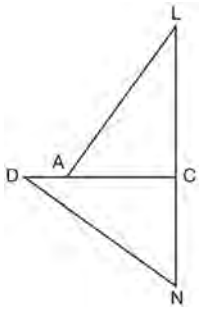
314 The aspect ratio (the ratio of screen width to height) of a rectangular flat-screen television is 16:9. The length of the diagonal of the screen is the television's screen size. Determine and state, to the *nearest inch*, the screen size (diagonal) of this flat-screen television with a screen height of 20.6 inches.

315 Keira has a square poster that she is framing and placing on her wall. The poster has a diagonal 58 cm long and fits exactly inside the frame. The width of the frame around the picture is 4 cm.



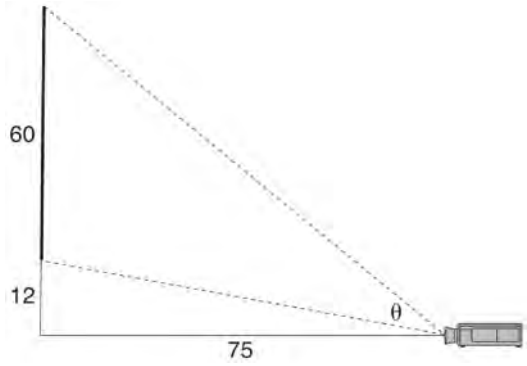
Determine and state the total area of the poster and frame to the *nearest tenth of a square centimeter*.

316 In the diagram of $\triangle LAC$ and $\triangle DNC$ below, $\overline{LA} \cong \overline{DN}$, $\overline{CA} \cong \overline{CN}$, and $\overline{DAC} \perp \overline{LCN}$.



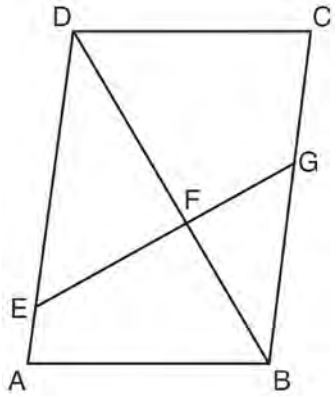
a) Prove that $\triangle LAC \cong \triangle DNC$.
b) Describe a sequence of rigid motions that will map $\triangle LAC$ onto $\triangle DNC$.

317 As modeled below, a movie is projected onto a large outdoor screen. The bottom of the 60-foot-tall screen is 12 feet off the ground. The projector sits on the ground at a horizontal distance of 75 feet from the screen.



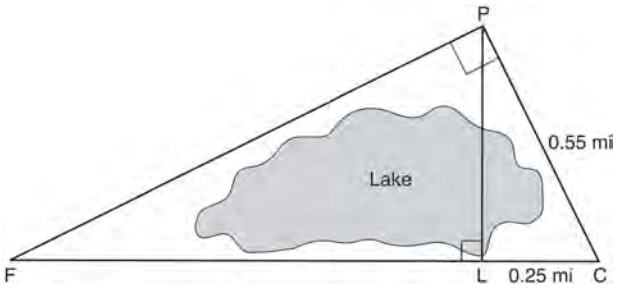
Determine and state, to the *nearest tenth of a degree*, the measure of θ, the projection angle.

318 Given: Parallelogram *ABCD*, $\overline{EFG}$, and diagonal $\overline{DFB}$



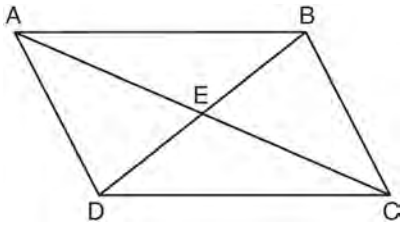
Prove: $\triangle DEF \sim \triangle BGF$

319 In the diagram below, the line of sight from the park ranger station, *P*, to the lifeguard chair, *L*, on the beach of a lake is perpendicular to the path joining the campground, *C*, and the first aid station, *F*. The campground is 0.25 mile from the lifeguard chair. The straight paths from both the campground and first aid station to the park ranger station are perpendicular.



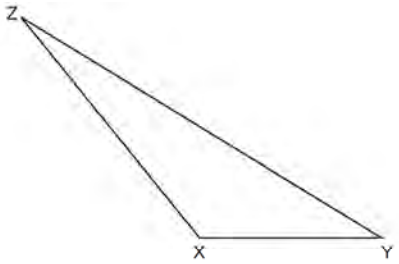
If the path from the park ranger station to the campground is 0.55 mile, determine and state, to the *nearest hundredth of a mile*, the distance between the park ranger station and the lifeguard chair. Gerald believes the distance from the first aid station to the campground is at least 1.5 miles. Is Gerald correct? Justify your answer.

320 Given: Quadrilateral *ABCD* is a parallelogram with diagonals $\overline{AC}$ and $\overline{BD}$ intersecting at *E*

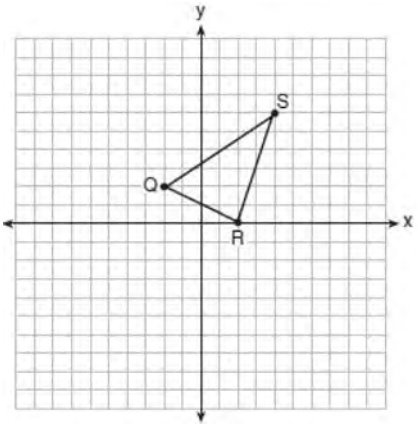


Prove: $\triangle AED \cong \triangle CEB$
Describe a single rigid motion that maps $\triangle AED$ onto $\triangle CEB$.

321 Triangle *XYZ* is shown below. Using a compass and straightedge, on the line below, construct and label $\triangle ABC$, such that $\triangle ABC \cong \triangle XYZ$. [Leave all construction marks.] Based on your construction, state the theorem that justifies why $\triangle ABC$ is congruent to $\triangle XYZ$.

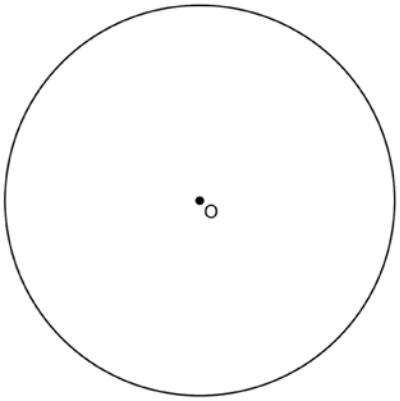


322 Triangle *QRS* is graphed on the set of axes below.



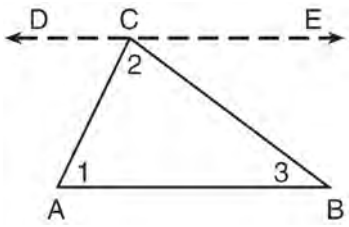
On the same set of axes, graph and label $\triangle Q'R'S'$, the image of $\triangle QRS$ after a dilation with a scale factor of $\frac{3}{2}$ centered at the origin. Use slopes to explain why $Q'R' \parallel QR$.

323 Using a compass and straightedge, construct a regular hexagon inscribed in circle *O* below. Label it *ABCDEF*. [Leave all construction marks.]



If chords $\overline{FB}$ and $\overline{FC}$ are drawn, which type of triangle, according to its angles, would $\triangle FBC$ be? Explain your answer.

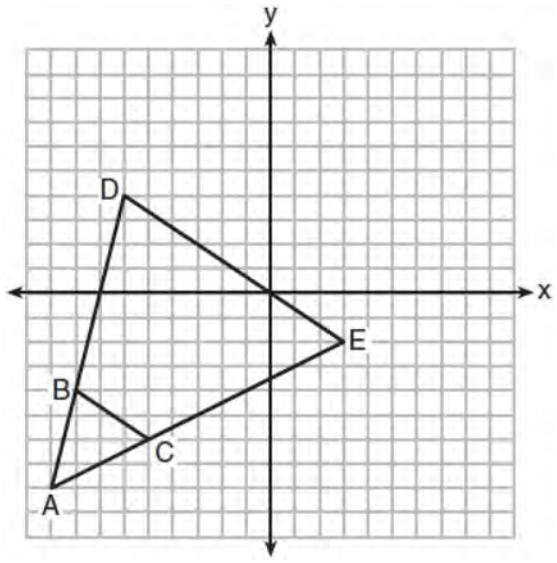
324 Given the theorem, "The sum of the measures of the interior angles of a triangle is 180°," complete the proof for this theorem.



Given: $\triangle ABC$
Prove: $m\angle 1 + m\angle 2 + m\angle 3 = 180°$
Fill in the missing reasons below.

Statements	Reasons
(1) $\triangle ABC$	(1) Given
(2) Through point C, draw $\overleftrightarrow{DCE}$ parallel to $\overline{AB}$.	(2) _____
(3) $m\angle 1 = m\angle ACD$, $m\angle 3 = m\angle BCE$	(3) _____
(4) $m\angle ACD + m\angle 2 + m\angle BCE = 180°$	(4) _____
(5) $m\angle 1 + m\angle 2 + m\angle 3 = 180°$	(5) _____

325 Triangle *ABC* and triangle *ADE* are graphed on the set of axes below.

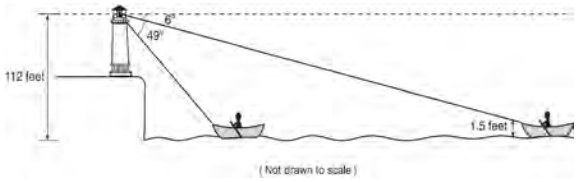


Describe a transformation that maps triangle *ABC* onto triangle *ADE*. Explain why this transformation makes triangle *ADE* similar to triangle *ABC*.

326 A candle maker uses a mold to make candles like the one shown below.

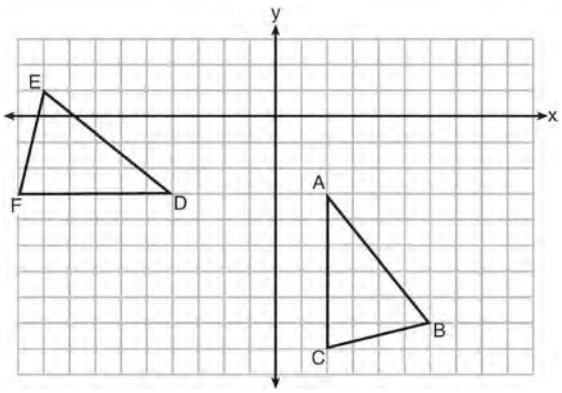
The height of the candle is 13 cm and the circumference of the candle at its widest measure is 31.416 cm. Use modeling to approximate how much wax, to the *nearest cubic centimeter*, is needed to make this candle. Justify your answer.

327 As shown below, a canoe is approaching a lighthouse on the coastline of a lake. The front of the canoe is 1.5 feet above the water and an observer in the lighthouse is 112 feet above the water.



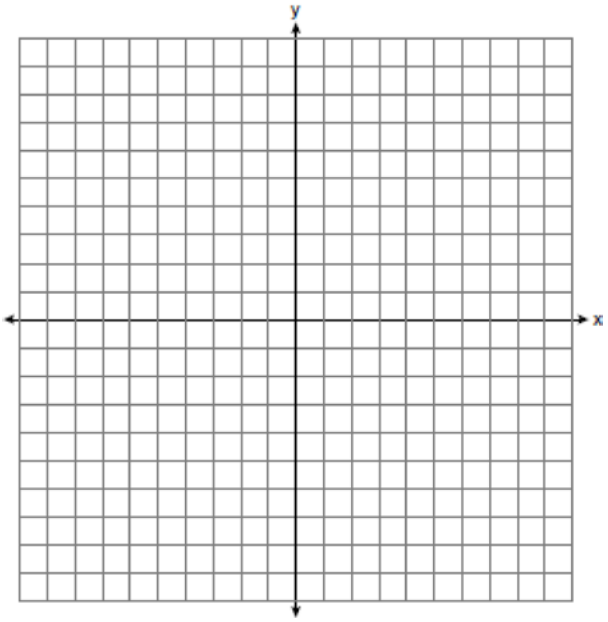
At 5:00, the observer in the lighthouse measured the angle of depression to the front of the canoe to be 6°. Five minutes later, the observer measured and saw the angle of depression to the front of the canoe had increased by 49°. Determine and state, to the *nearest foot per minute*, the average speed at which the canoe traveled toward the lighthouse.

328 The grid below shows $\triangle ABC$ and $\triangle DEF$.

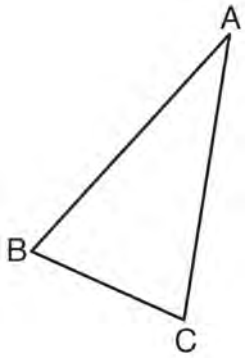


Let $\triangle A'B'C'$ be the image of $\triangle ABC$ after a rotation about point *A*. Determine and state the location of B' if the location of point C' is $(8,-3)$. Explain your answer. Is $\triangle DEF$ congruent to $\triangle A'B'C'$? Explain your answer.

329 Triangle PQR has vertices $P(-3,-1)$, $Q(-1,7)$, and $R(3,3)$, and points A and B are midpoints of $\overline{PQ}$ and $\overline{RQ}$, respectively. Use coordinate geometry to prove that $\overline{AB}$ is parallel to $\overline{PR}$ and is half the length of $\overline{PR}$. [The use of the set of axes below is optional.]

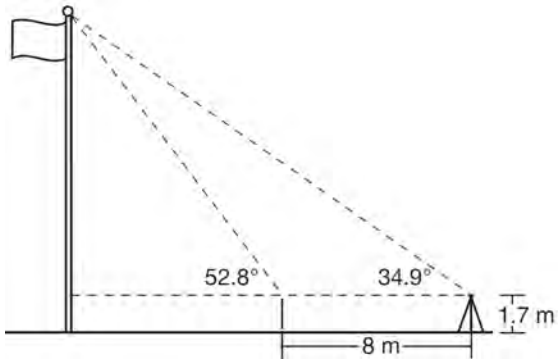


330 Using a compass and straightedge, construct and label $\triangle A'B'C'$, the image of $\triangle ABC$ after a dilation with a scale factor of 2 and centered at B. [Leave all construction marks.] Describe the relationship between the lengths of $\overline{AC}$ and $\overline{A'C'}$.



Geometry 6 Point Regents Exam Questions

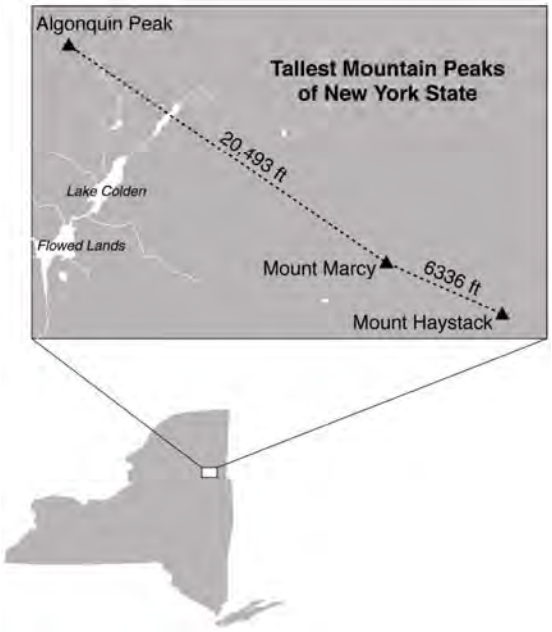
331 Cathy wants to determine the height of the flagpole shown in the diagram below. She uses a survey instrument to measure the angle of elevation to the top of the flagpole, and determines it to be 34.9°. She walks 8 meters closer and determines the new measure of the angle of elevation to be 52.8°. At each measurement, the survey instrument is 1.7 meters above the ground.



Determine and state, to the *nearest tenth of a meter*, the height of the flagpole.

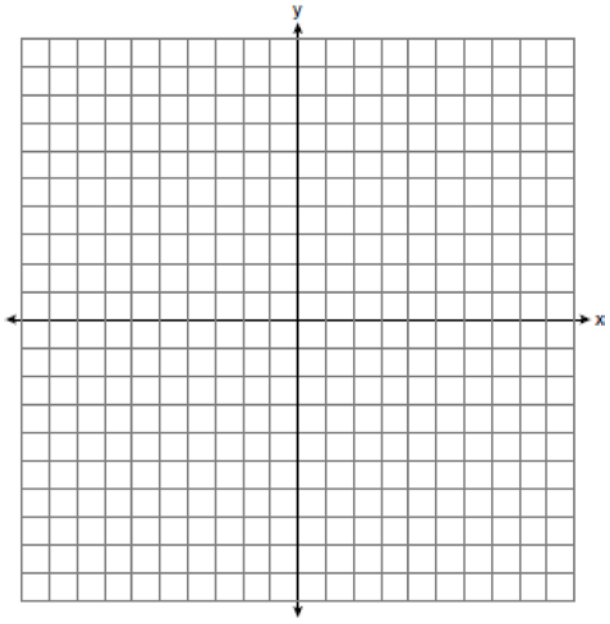
332 New streetlights will be installed along a section of the highway. The posts for the streetlights will be 7.5 m tall and made of aluminum. The city can choose to buy the posts shaped like cylinders or the posts shaped like rectangular prisms. The cylindrical posts have a hollow core, with aluminum 2.5 cm thick, and an outer diameter of 53.4 cm. The rectangular-prism posts have a hollow core, with aluminum 2.5 cm thick, and a square base that measures 40 cm on each side. The density of aluminum is 2.7 g/cm3, and the cost of aluminum is $0.38 per kilogram. If all posts must be the same shape, which post design will cost the town less? How much money will be saved per streetlight post with the less expensive design?

333 The map below shows the three tallest mountain peaks in New York State: Mount Marcy, Algonquin Peak, and Mount Haystack. Mount Haystack, the shortest peak, is 4960 feet tall. Surveyors have determined the horizontal distance between Mount Haystack and Mount Marcy is 6336 feet and the horizontal distance between Mount Marcy and Algonquin Peak is 20,493 feet.



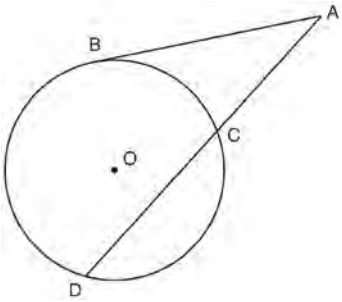
The angle of depression from the peak of Mount Marcy to the peak of Mount Haystack is 3.47 degrees. The angle of elevation from the peak of Algonquin Peak to the peak of Mount Marcy is 0.64 degrees. What are the heights, to the *nearest foot*, of Mount Marcy and Algonquin Peak? Justify your answer.

334 In the coordinate plane, the vertices of triangle *PAT* are $P(-1,-6)$, $A(-4,5)$, and $T(5,-2)$. Prove that $\triangle PAT$ is an isosceles triangle. [The use of the set of axes below is optional.] State the coordinates of *R* so that quadrilateral *PART* is a parallelogram. Prove that quadrilateral *PART* is a parallelogram.



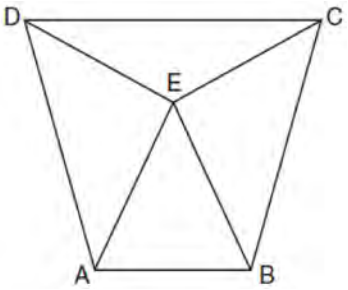
335 Freda, who is training to use a radar system, detects an airplane flying at a constant speed and heading in a straight line to pass directly over her location. She sees the airplane at an angle of elevation of 15° and notes that it is maintaining a constant altitude of 6250 feet. One minute later, she sees the airplane at an angle of elevation of 52°. How far has the airplane traveled, to the *nearest foot*? Determine and state the speed of the airplane, to the *nearest mile per hour*.

336 In the diagram below, secant $\overline{ACD}$ and tangent $\overline{AB}$ are drawn from external point *A* to circle *O*.



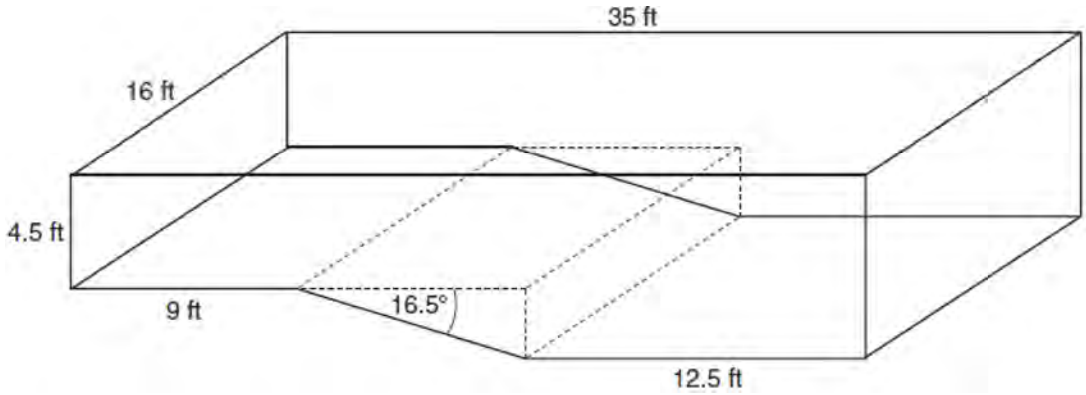
Prove the theorem: If a secant and a tangent are drawn to a circle from an external point, the product of the lengths of the secant segment and its external segment equals the length of the tangent segment squared. ($AC \cdot AD = AB^2$)

337 Isosceles trapezoid *ABCD* has bases $\overline{DC}$ and $\overline{AB}$ with nonparallel legs $\overline{AD}$ and $\overline{BC}$. Segments *AE*, *BE*, *CE*, and *DE* are drawn in trapezoid *ABCD* such that $\angle CDE \cong \angle DCE$, $\overline{AE} \perp \overline{DE}$, and $\overline{BE} \perp \overline{CE}$.



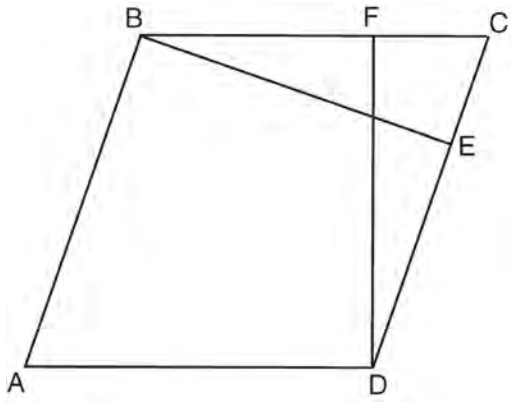
Prove $\triangle ADE \cong \triangle BCE$ and prove $\triangle AEB$ is an isosceles triangle.

338 A rectangular in-ground pool is modeled by the prism below. The inside of the pool is 16 feet wide and 35 feet long. The pool has a shallow end and a deep end, with a sloped floor connecting the two ends. Without water, the shallow end is 9 feet long and 4.5 feet deep, and the deep end of the pool is 12.5 feet long.



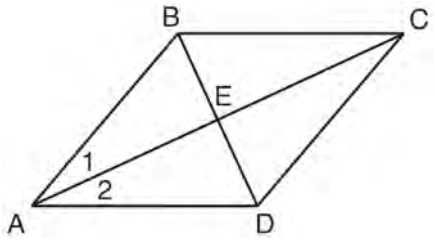
If the sloped floor has an angle of depression of 16.5 degrees, what is the depth of the pool at the deep end, to the *nearest tenth of a foot*? Find the volume of the inside of the pool to the *nearest cubic foot*. A garden hose is used to fill the pool. Water comes out of the hose at a rate of 10 .5 gallons per minute. How much time, to the *nearest hour*, will it take to fill the pool 6 inches from the top? [1 ft^3=7.48 gallons]

339 In the diagram of parallelogram *ABCD* below, $\overline{BE} \perp \overline{CED}$, $\overline{DF} \perp \overline{BFC}$, $\overline{CE} \cong \overline{CF}$.



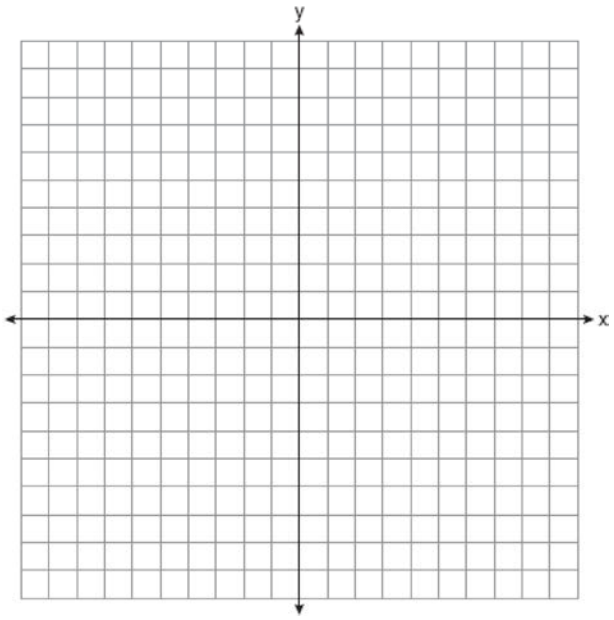
Prove *ABCD* is a rhombus.

340 Given: Quadrilateral *ABCD* with diagonals $\overline{AC}$ and $\overline{BD}$ that bisect each other, and $\angle 1 \cong \angle 2$

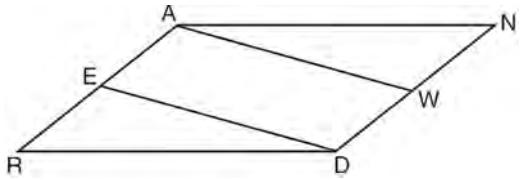


Prove: $\triangle ACD$ is an isosceles triangle and $\triangle AEB$ is a right triangle

341 Quadrilateral $PQRS$ has vertices $P(-2,3)$, $Q(3,8)$, $R(4,1)$, and $S(-1,-4)$. Prove that $PQRS$ is a rhombus. Prove that $PQRS$ is *not* a square. [The use of the set of axes below is optional.]

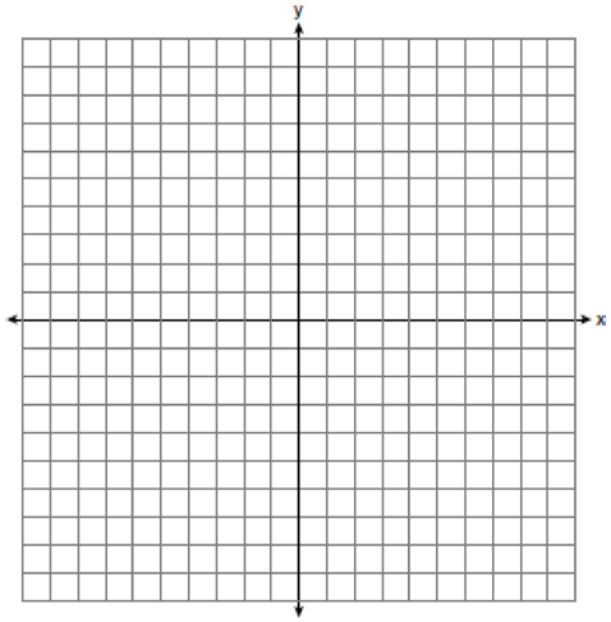


342 Given: Parallelogram $ANDR$ with $\overline{AW}$ and $\overline{DE}$ bisecting $\overline{NWD}$ and $\overline{REA}$ at points W and E, respectively

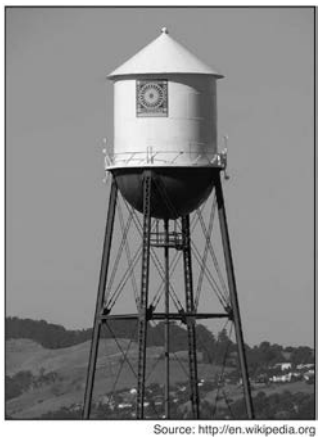


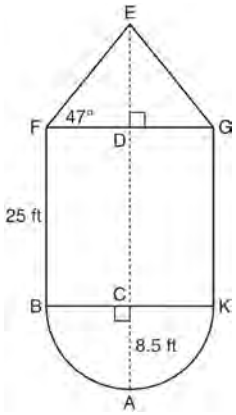
Prove that $\triangle ANW \cong \triangle DRE$. Prove that quadrilateral $AWDE$ is a parallelogram.

343 In the coordinate plane, the vertices of $\triangle RST$ are $R(6,-1)$, $S(1,-4)$, and $T(-5,6)$. Prove that $\triangle RST$ is a right triangle. State the coordinates of point P such that quadrilateral $RSTP$ is a rectangle. Prove that your quadrilateral $RSTP$ is a rectangle. [The use of the set of axes below is optional.]



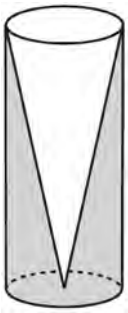
344 The water tower in the picture below is modeled by the two-dimensional figure beside it. The water tower is composed of a hemisphere, a cylinder, and a cone. Let *C* be the center of the hemisphere and let *D* be the center of the base of the cone.


Source: http://en.wikipedia.org



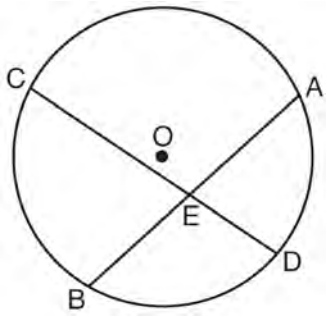
If $AC = 8.5$ feet, $BF = 25$ feet, and $m\angle EFD = 47°$, determine and state, to the *nearest cubic foot*, the volume of the water tower. The water tower was constructed to hold a maximum of 400,000 pounds of water. If water weighs 62.4 pounds per cubic foot, can the water tower be filled to 85% of its volume and *not* exceed the weight limit? Justify your answer.

345 Walter wants to make 100 candles in the shape of a cone for his new candle business. The mold shown below will be used to make the candles. Each mold will have a height of 8 inches and a diameter of 3 inches. To the *nearest cubic inch*, what will be the total volume of 100 candles?



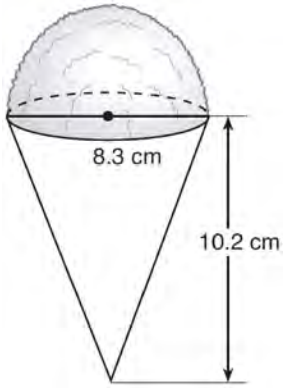
Walter goes to a hobby store to buy the wax for his candles. The wax costs $0.10 per ounce. If the weight of the wax is 0.52 ounce per cubic inch, how much will it cost Walter to buy the wax for 100 candles? If Walter spent a total of $37.83 for the molds and charges $1.95 for each candle, what is Walter's profit after selling 100 candles?

346 Given: Circle *O*, chords $\overline{AB}$ and $\overline{CD}$ intersect at *E*



Theorem: If two chords intersect in a circle, the product of the lengths of the segments of one chord is equal to the product of the lengths of the segments of the other chord. Prove this theorem by proving $AE \cdot EB = CE \cdot ED$.

347 A snow cone consists of a paper cone completely filled with shaved ice and topped with a hemisphere of shaved ice, as shown in the diagram below. The inside diameter of both the cone and the hemisphere is 8.3 centimeters. The height of the cone is 10.2 centimeters.



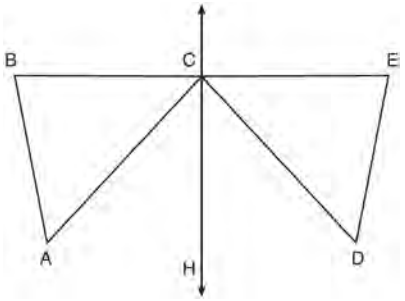
The desired density of the shaved ice is $0.697\ \text{g/cm}^3$, and the cost, per kilogram, of ice is \$3.83. Determine and state the cost of the ice needed to make 50 snow cones.

348 Given: D is the image of A after a reflection over $\overleftrightarrow{CH}$.

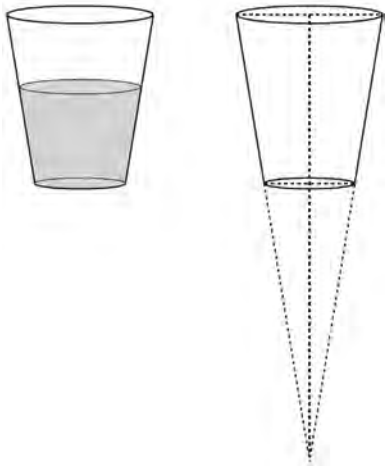
$\overleftrightarrow{CH}$ is the perpendicular bisector of $\overline{BCE}$

$\triangle ABC$ and $\triangle DEC$ are drawn

Prove: $\triangle ABC \cong \triangle DEC$

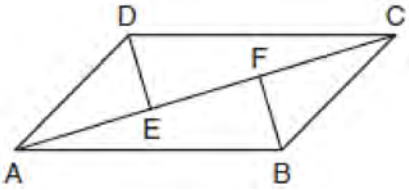


349 A water glass can be modeled by a truncated right cone (a cone which is cut parallel to its base) as shown below.



The diameter of the top of the glass is 3 inches, the diameter at the bottom of the glass is 2 inches, and the height of the glass is 5 inches. The base with a diameter of 2 inches must be parallel to the base with a diameter of 3 inches in order to find the height of the cone. Explain why. Determine and state, in inches, the height of the larger cone. Determine and state, to the *nearest tenth of a cubic inch*, the volume of the water glass.

350 In quadrilateral $ABCD$, $\overline{AB} \cong \overline{CD}$, $\overline{AB} \| \overline{CD}$, and $\overline{BF}$ and $\overline{DE}$ are perpendicular to diagonal $\overline{AC}$ at points F and E.



Prove: $\overline{AE} \cong \overline{CF}$

Geometry Common Core State Standards Multiple Choice Regents Exam Questions
Answer Section

1 ANS: 2

$SA = 6 \cdot 12^2 = 864$

$\frac{864}{450} = 1.92$

PTS: 2 REF: 061519geo TOP: Surface Area

2 ANS: 3

$\frac{9}{5} = \frac{9.2}{x}$ $5.1 + 9.2 = 14.3$

$9x = 46$

$x \approx 5.1$

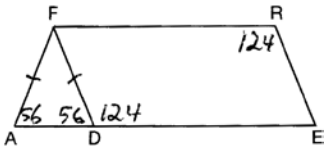
PTS: 2 REF: 061511geo TOP: Side Splitter Theorem

3 ANS: 1 PTS: 2 REF: 081504geo TOP: Cofunctions

4 ANS: 1 PTS: 2 REF: 081605geo TOP: Rotations

KEY: grids

5 ANS: 3



PTS: 2 REF: 081508geo TOP: Interior and Exterior Angles of Polygons

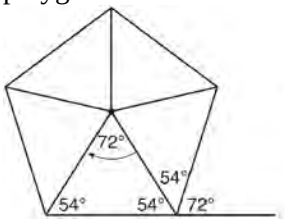
6 ANS: 4

Opposite angles of an inscribed quadrilateral are supplementary.

PTS: 2 REF: 011821geo TOP: Inscribed Quadrilaterals

7 ANS: 2

Segments drawn from the center of the regular pentagon bisect each angle of the pentagon, and create five isosceles triangles as shown in the diagram below. Since each exterior angle equals the angles formed by the segments drawn from the center of the regular pentagon, the minimum degrees necessary to carry a regular polygon onto itself are equal to the measure of an exterior angle of the regular polygon.



$\frac{360}{5} = 72.$

PTS: 2 REF: spr1402geo TOP: Mapping a Polygon onto Itself

8 ANS: 3

$v = \pi r^2 h$ (1) $6^2 \cdot 10 = 360$

$150\pi = \pi r^2 h$ (2) $10^2 \cdot 6 = 600$

$150 = r^2 h$ (3) $5^2 \cdot 6 = 150$

(4) $3^2 \cdot 10 = 900$

PTS: 2 REF: 081713geo TOP: Rotations of Two-Dimensional Objects

9 ANS: 2

$$\frac{1\,\text{l}}{1.2\,\text{oz}}\left(\frac{16\,\text{oz}}{1\,\text{lb}}\right) = \frac{13.\overline{3}\,\text{l}}{\text{lb}} \quad \frac{13.\overline{3}\,\text{l}}{\text{lb}}\left(\frac{1\,\text{g}}{3.785\,\text{l}}\right) \approx \frac{3.5\,\text{g}}{1\,\text{lb}}$$

PTS: 2 REF: 061618geo TOP: Density

10 ANS: 2

The line $y = 2x - 4$ does not pass through the center of dilation, so the dilated line will be distinct from $y = 2x - 4$. Since a dilation preserves parallelism, the line $y = 2x - 4$ and its image will be parallel, with slopes of 2. To obtain the y-intercept of the dilated line, the scale factor of the dilation, $\frac{3}{2}$, can be applied to the y-intercept, $(0,-4)$. Therefore, $\left(0 \cdot \frac{3}{2}, -4 \cdot \frac{3}{2}\right) \rightarrow (0,-6)$. So the equation of the dilated line is $y = 2x - 6$.

PTS: 2 REF: fall1403geo TOP: Line Dilations

11 ANS: 3 PTS: 2 REF: 061706geo TOP: Line Dilations

12 ANS: 1 PTS: 2 REF: 011811geo TOP: Dilations

13 ANS: 1 PTS: 2 REF: 011703geo TOP: Triangle Congruency

14 ANS: 4 PTS: 2 REF: 081702geo TOP: Identifying Transformations
KEY: basic

15 ANS: 2 PTS: 2 REF: 061720geo TOP: Parallelograms

16 ANS: 1 PTS: 2 REF: 011716geo TOP: Special Quadrilaterals

17 ANS: 4

The slope of $\overline{BC}$ is $\frac{2}{5}$. Altitude is perpendicular, so its slope is $-\frac{5}{2}$.

PTS: 2 REF: 061614geo TOP: Parallel and Perpendicular Lines
KEY: find slope of perpendicular line

18 ANS: 2 PTS: 2 REF: 011610geo TOP: Line Dilations

19 ANS: 3

1) $\frac{12}{9} = \frac{4}{3}$ 2) AA 3) $\frac{32}{16} \neq \frac{8}{2}$ 4) SAS

PTS: 2 REF: 061605geo TOP: Similarity KEY: basic

20 ANS: 2

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

$x^2 - 6x + 9 + y^2 + 2y + 1 = 6 + 9 + 1$

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

PTS: 2 REF: 011812geo TOP: Equations of Circles
KEY: completing the square

21 ANS: 2

$\sqrt{3 \cdot 21} = \sqrt{63} = 3\sqrt{7}$

PTS: 2 REF: 011622geo TOP: Similarity KEY: altitude

22 ANS: 3 PTS: 2 REF: 081515geo TOP: Inscribed Quadrilaterals

23 ANS: 1

$\frac{6}{8} = \frac{9}{12}$

PTS: 2 REF: 011613geo TOP: Similarity KEY: basic

24 ANS: 1 PTS: 2 REF: 081606geo TOP: Cofunctions

25 ANS: 1

1) opposite sides; 2) adjacent sides; 3) perpendicular diagonals; 4) diagonal bisects angle

PTS: 2 REF: 061609geo TOP: Special Quadrilaterals

26 ANS: 2

$8(x + 8) = 6(x + 18)$

$8x + 64 = 6x + 108$

$2x = 44$

$x = 22$

PTS: 2 REF: 011715geo TOP: Chords, Secants and Tangents
KEY: secants drawn from common point, length

27 ANS: 4 PTS: 2 REF: 011609geo TOP: Cofunctions

28 ANS: 1 PTS: 2 REF: 061520geo TOP: Chords, Secants and Tangents
KEY: mixed

29 ANS: 3

$x^2 + 4x + 4 + y^2 - 6y + 9 = 12 + 4 + 9$

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

PTS: 2 REF: 081509geo TOP: Equations of Circles
KEY: completing the square

30 ANS: 2

$\frac{4}{3}\pi \cdot 4^3 + 0.075 \approx 20$

PTS: 2 REF: 011619geo TOP: Density

31 ANS: 1

$m = \left(\frac{-11+5}{2}, \frac{5+-7}{2}\right) = (-3,-1)$ $m = \frac{5--7}{-11-5} = \frac{12}{-16} = -\frac{3}{4}$ $m_{\perp} = \frac{4}{3}$

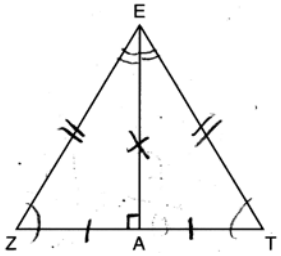
PTS: 2 REF: 061612geo TOP: Parallel and Perpendicular Lines
KEY: perpendicular bisector

32 ANS: 3 PTS: 2 REF: 011815geo TOP: Mapping a Polygon onto Itself

33 ANS: 4 PTS: 2 REF: 061711geo TOP: Special Quadrilaterals

34 ANS: 2 PTS: 2 REF: 081619geo TOP: Sectors

35 ANS: 2



PTS: 2 REF: 061619geo TOP: Triangle Proofs

36 ANS: 3

$6x - 40 + x + 20 = 180 - 3x$ $\text{m}\angle BAC = 180 - (80 + 40) = 60$

$10x = 200$

$x = 20$

PTS: 2 REF: 011809geo TOP: Exterior Angle Theorem

37 ANS: 4 PTS: 2 REF: 011819geo TOP: Special Quadrilaterals

38 ANS: 2

$m = \frac{3}{2}$. $1 = -\frac{2}{3}(-6) + b$

$m_{\perp} = -\frac{2}{3}$ $1 = 4 + b$

$-3 = b$

PTS: 2 REF: 061719geo TOP: Parallel and Perpendicular Lines
KEY: write equation of perpendicular line

39 ANS: 4 PTS: 2 REF: 011816geo TOP: Chords, Secants and Tangents
KEY: inscribed

40 ANS: 3

$\sqrt{(-5)^2 + 12^2} = \sqrt{169} \quad \sqrt{11^2 + (2\sqrt{12})^2} = \sqrt{121 + 48} = \sqrt{169}$

PTS: 2 REF: 011722geo TOP: Circles in the Coordinate Plane

41 ANS: 4 PTS: 2 REF: 061501geo TOP: Rotations of Two-Dimensional Objects

42 ANS: 1

$V = \frac{1}{3}\pi\left(\frac{1.5}{2}\right)^2\left(\frac{4}{2}\right) \approx 1.2$

PTS: 2 REF: 011724geo TOP: Volume KEY: cones

43 ANS: 4 PTS: 2 REF: 061504geo TOP: Compositions of Transformations
KEY: identify

44 ANS: 3

$\tan 34 = \frac{T}{20}$

$T \approx 13.5$

PTS: 2 REF: 061505geo TOP: Using Trigonometry to Find a Side
KEY: graphics

45 ANS: 1

$m = -\frac{2}{3} \quad 1 = \left(-\frac{2}{3}\right)6 + b$

$1 = -4 + b$

$5 = b$

PTS: 2 REF: 081510geo TOP: Parallel and Perpendicular Lines
KEY: write equation of parallel line

46 ANS: 1

$m_{\overline{TA}} = -1 \quad y = mx + b$

$m_{\overline{EM}} = 1 \quad 1 = 1(2) + b$

$-1 = b$

PTS: 2 REF: 081614geo TOP: Quadrilaterals in the Coordinate Plane
KEY: general

47 ANS: 4

$\frac{360°}{10} = 36° \;\; 252°$ is a multiple of 36°

PTS: 2 REF: 011717geo TOP: Mapping a Polygon onto Itself

48 ANS: 4 PTS: 2 REF: 011611geo TOP: Properties of Transformations
KEY: graphics

49 ANS: 4

$\sqrt{(32-8)^2+(28--4)^2} = \sqrt{576+1024} = \sqrt{1600} = 40$

PTS: 2 REF: 081621geo TOP: Line Dilations

50 ANS: 2

$x^2+y^2+6y+9 = 7+9$

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

PTS: 2 REF: 061514geo TOP: Equations of Circles
KEY: completing the square

51 ANS: 2 PTS: 2 REF: 081601geo TOP: Lines and Angles

52 ANS: 1

The man's height, 69 inches, is opposite to the angle of elevation, and the shadow length, 102 inches, is adjacent to the angle of elevation. Therefore, tangent must be used to find the angle of elevation. $\tan x = \frac{69}{102}$

$x \approx 34.1$

PTS: 2 REF: fall1401geo TOP: Using Trigonometry to Find an Angle

53 ANS: 2

(1) AA; (3) SAS; (4) SSS. NYSED has stated that all students should be awarded credit regardless of their answer to this question.

PTS: 2 REF: 061724geo TOP: Similarity KEY: basic

54 ANS: 4 PTS: 2 REF: 081609geo TOP: Compositions of Transformations
KEY: grids

55 ANS: 4

$\frac{360°}{10} = 36°$ 252º is a multiple of 36º

PTS: 2 REF: 081722geo TOP: Mapping a Polygon onto Itself

56 ANS: 3

$4\sqrt{(-1--3)^2+(5-1)^2} = 4\sqrt{20}$

PTS: 2 REF: 081703geo TOP: Polygons in the Coordinate Plane

57 ANS: 2

x is $\frac{1}{2}$ the circumference. $\frac{C}{2} = \frac{10\pi}{2} \approx 16$

PTS: 2 REF: 061523geo TOP: Circumference

58 ANS: 4

The line $y = 3x - 1$ passes through the center of dilation, so the dilated line is not distinct.

PTS: 2 REF: 081524geo TOP: Line Dilations

59 ANS: 4

$\frac{1}{3.5} = \frac{x}{18 - x}$

$3.5x = 18 - x$

$4.5x = 18$

$x = 4$

PTS: 2 REF: 081707geo TOP: Side Splitter Theorem

60 ANS: 4 PTS: 2 REF: 061502geo TOP: Identifying Transformations
KEY: basic

61 ANS: 3

$\frac{x}{360} \cdot 3^2\pi = 2\pi \quad 180 - 80 = 100$

$x = 80 \quad \frac{180 - 100}{2} = 40$

PTS: 2 REF: 011612geo TOP: Sectors

62 ANS: 4

$\sin 70 = \frac{x}{20}$

$x \approx 18.8$

PTS: 2 REF: 061611geo TOP: Using Trigonometry to Find a Side
KEY: without graphics

63 ANS: 4

$V = \pi\left(\frac{6.7}{2}\right)^2 (4 \cdot 6.7) \approx 945$

PTS: 2 REF: 081620geo TOP: Volume KEY: cylinders

64 ANS: 1 PTS: 2 REF: 011608geo TOP: Compositions of Transformations
KEY: identify

65 ANS: 1
Alternate interior angles

PTS: 2 REF: 061517geo TOP: Lines and Angles

66 ANS: 1

$3 + \frac{2}{5}(8 - 3) = 3 + \frac{2}{5}(5) = 3 + 2 = 5 \quad 5 + \frac{2}{5}(-5 - 5) = 5 + \frac{2}{5}(-10) = 5 - 4 = 1$

PTS: 2 REF: 011720geo TOP: Directed Line Segments

67 ANS: 4

$m = -\frac{1}{2}$ $-4 = 2(6) + b$

$m_{\perp} = 2$ $-4 = 12 + b$

$-16 = b$

PTS: 2 REF: 011602geo TOP: Parallel and Perpendicular Lines
KEY: write equation of perpendicular line

68 ANS: 2 PTS: 2 REF: 081513geo TOP: Identifying Transformations
KEY: graphics

69 ANS: 2 PTS: 2 REF: 081519geo TOP: Similarity
KEY: basic

70 ANS: 4 PTS: 2 REF: 061513geo TOP: Parallelograms

71 ANS: 4 PTS: 2 REF: 061606geo TOP: Volume
KEY: compositions

72 ANS: 2 PTS: 2 REF: 061506geo
TOP: Cross-Sections of Three-Dimensional Objects

73 ANS: 3

$$\frac{\frac{4}{3}\pi\left(\frac{9.5}{2}\right)^3}{\frac{4}{3}\pi\left(\frac{2.5}{2}\right)^3} \approx 55$$

PTS: 2 REF: 011614geo TOP: Volume KEY: spheres

74 ANS: 1

$\frac{f}{4} = \frac{15}{6}$

$f = 10$

PTS: 2 REF: 061617geo TOP: Lines and Angles

75 ANS: 4

$\frac{6.6}{x} = \frac{4.2}{5.25}$

$4.2x = 34.65$

$x = 8.25$

PTS: 2 REF: 081705geo TOP: Similarity KEY: basic

76 ANS: 2 PTS: 2 REF: 061709geo TOP: Triangle Proofs
KEY: statements

77 ANS: 4 PTS: 2 REF: 011704geo TOP: Midsegments

78 ANS: 3 PTS: 2 REF: 081622geo TOP: Triangle Proofs
KEY: statements

79 ANS: 2 PTS: 2 REF: 061610geo TOP: Chords, Secants and Tangents
KEY: inscribed

80 ANS: 4 PTS: 2 REF: 061608geo TOP: Compositions of Transformations
KEY: grids
81 ANS: 1 PTS: 2 REF: 061518geo TOP: Line Dilations
82 ANS: 4 PTS: 2 REF: 011706geo TOP: Identifying Transformations
KEY: basic
83 ANS: 2

$\sqrt{(-1-2)^2+(4-3)^2} = \sqrt{10}$

PTS: 2 REF: 011615geo TOP: Polygons in the Coordinate Plane
84 ANS: 3

$V = \frac{1}{3}\pi r^2 h$

$54.45\pi = \frac{1}{3}\pi(3.3)^2 h$

$h = 15$

PTS: 2 REF: 011807geo TOP: Volume KEY: cones
85 ANS: 3 PTS: 2 REF: 081502geo TOP: Identifying Transformations
KEY: basic
86 ANS: 2

$-4+\frac{2}{5}(6--4) = -4+\frac{2}{5}(10) = -4+4 = 0 \quad 5+\frac{2}{5}(20-5) = 5+\frac{2}{5}(15) = 5+6 = 11$

PTS: 2 REF: 061715geo TOP: Directed Line Segments
87 ANS: 2 PTS: 2 REF: 011802geo TOP: Parallelograms
88 ANS: 3

$\theta = \frac{s}{r} = \frac{2\pi}{10} = \frac{\pi}{5}$

PTS: 2 REF: fall1404geo TOP: Arc Length KEY: angle
89 ANS: 1 PTS: 2 REF: 061508geo TOP: Chords, Secants and Tangents
KEY: inscribed
90 ANS: 2

$h^2 = 30 \cdot 12$

$h^2 = 360$

$h = 6\sqrt{10}$

PTS: 2 REF: 061613geo TOP: Similarity KEY: altitude
91 ANS: 1 PTS: 2 REF: 081507geo TOP: Compositions of Transformations
KEY: identify
92 ANS: 4 PTS: 2 REF: 061512geo TOP: Cofunctions

93 ANS: 3

$V = 12 \cdot 8.5 \cdot 4 = 408$

$W = 408 \cdot 0.25 = 102$

PTS: 2 REF: 061507geo TOP: Density

94 ANS: 1

The line $3y = -2x + 8$ does not pass through the center of dilation, so the dilated line will be distinct from $3y = -2x + 8$. Since a dilation preserves parallelism, the line $3y = -2x + 8$ and its image $2x + 3y = 5$ are parallel, with slopes of $-\frac{2}{3}$.

PTS: 2 REF: 061522geo TOP: Line Dilations

95 ANS: 3

$\frac{60}{360} \cdot 6^2 \pi = 6\pi$

PTS: 2 REF: 081518geo TOP: Sectors

96 ANS: 2 PTS: 2 REF: 061701geo TOP: Compositions of Transformations
KEY: identify

97 ANS: 3

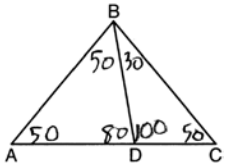
$\frac{24}{40} = \frac{15}{x}$

$24x = 600$

$x = 25$

PTS: 2 REF: 011813geo TOP: Side Splitter Theorem

98 ANS: 2



PTS: 2 REF: 081604geo TOP: Interior and Exterior Angles of Triangles

99 ANS: 2 PTS: 2 REF: 061516geo TOP: Dilations

100 ANS: 1

$m = \frac{-4}{-6} = \frac{2}{3}$

$m_{\perp} = -\frac{3}{2}$

PTS: 2 REF: 011820geo TOP: Parallel and Perpendicular Lines
KEY: write equation of perpendicular line

101 ANS: 2

$12^2 = 9 \cdot 16$

$144 = 144$

PTS: 2 REF: 081718geo TOP: Similarity KEY: leg

102 ANS: 2

$\angle B = 180 - (82 + 26) = 72$; $\angle DEC = 180 - 26 = 154$; $\angle EDB = 360 - (154 + 26 + 72) = 108$; $\angle BDF = \frac{108}{2} = 54$; $\angle DFB = 180 - (54 + 72) = 54$

PTS: 2 REF: 061710geo TOP: Interior and Exterior Angles of Triangles

103 ANS: 4

$\frac{1}{2} = \frac{x+3}{3x-1}$ $GR = 3(7) - 1 = 20$

$3x - 1 = 2x + 6$

$x = 7$

PTS: 2 REF: 011620geo TOP: Similarity KEY: basic

104 ANS: 4

$\frac{-2-1}{-1--3} = \frac{-3}{2}$ $\frac{3-2}{0-5} = \frac{1}{-5}$ $\frac{3-1}{0--3} = \frac{2}{3}$ $\frac{2--2}{5--1} = \frac{4}{6} = \frac{2}{3}$

PTS: 2 REF: 081522geo TOP: Quadrilaterals in the Coordinate Plane
KEY: general

105 ANS: 1

$84 = \frac{1}{3} \cdot s^2 \cdot 7$

$6 = s$

PTS: 2 REF: 061716geo TOP: Volume KEY: pyramids

106 ANS: 4

$2592276 = \frac{1}{3} \cdot s^2 \cdot 146.5$

$230 \approx s$

PTS: 2 REF: 081521geo TOP: Volume KEY: pyramids

107 ANS: 3

$\frac{x}{10} = \frac{6}{4}$ $\overline{CD} = 15 - 4 = 11$

$x = 15$

PTS: 2 REF: 081612geo TOP: Similarity KEY: basic

108 ANS: 4

$40 - x + 3x = 90$

$2x = 50$

$x = 25$

PTS: 2 REF: 081721geo TOP: Cofunctions

109 ANS: 4

$x^2 + 6x + 9 + y^2 - 4y + 4 = 23 + 9 + 4$

$(x+3)^2 + (y-2)^2 = 36$

PTS: 2 REF: 011617geo TOP: Equations of Circles
KEY: completing the square

110 ANS: 1

$x^2 + y^2 - 6y + 9 = -1 + 9$

$x^2 + (y-3)^2 = 8$

PTS: 2 REF: 011718geo TOP: Equations of Circles
KEY: completing the square

111 ANS: 3

$y = mx + b$

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

$3 = b$

PTS: 2 REF: 011701geo TOP: Parallel and Perpendicular Lines
KEY: write equation of parallel line

112 ANS: 2

The given line h, $2x + y = 1$, does not pass through the center of dilation, the origin, because the y-intercept is at $(0,1)$. The slope of the dilated line, m, will remain the same as the slope of line h, -2. All points on line h, such as $(0,1)$, the y-intercept, are dilated by a scale factor of 4; therefore, the y-intercept of the dilated line is $(0,4)$ because the center of dilation is the origin, resulting in the dilated line represented by the equation $y = -2x + 4$.

PTS: 2 REF: spr1403geo TOP: Line Dilations

113 ANS: 3

$\frac{60}{360} \cdot 8^2\pi = \frac{1}{6} \cdot 64\pi = \frac{32\pi}{3}$

PTS: 2 REF: 061624geo TOP: Sectors

114 ANS: 3 PTS: 2 REF: 061703geo TOP: Cofunctions

115 ANS: 3

$\cos A = \frac{9}{14}$

$A \approx 50°$

PTS: 2 REF: 011616geo TOP: Using Trigonometry to Find an Angle

116 ANS: 2 PTS: 2 REF: 011805geo

TOP: Cross-Sections of Three-Dimensional Objects

117 ANS: 1

Since a dilation preserves parallelism, the line $4y = 3x + 7$ and its image $3x - 4y = 9$ are parallel, with slopes of $\frac{3}{4}$.

PTS: 2 REF: 081710geo TOP: Line Dilations

118 ANS: 2

$C = \pi d \quad V = \pi\left(\frac{2.25}{\pi}\right)^2 \cdot 8 \approx 12.8916 \quad W = 12.8916 \cdot 752 \approx 9694$

$4.5 = \pi d$

$\frac{4.5}{\pi} = d$

$\frac{2.25}{\pi} = r$

PTS: 2 REF: 081617geo TOP: Density

119 ANS: 1

$V = \frac{1}{3}\pi(4)^2(6) = 32\pi$

PTS: 2 REF: 061718geo TOP: Rotations of Two-Dimensional Objects

120 ANS: 1 PTS: 2 REF: 061707geo TOP: Mapping a Polygon onto Itself

121 ANS: 4 PTS: 2 REF: 081503geo TOP: Rotations of Two-Dimensional Objects

122 ANS: 3

$2.5 \times 1.25 \times (27 \times 12) + \frac{1}{2}\pi(1.25)^2(27 \times 12) \approx 1808$

PTS: 2 REF: 061723geo TOP: Volume KEY: compositions

123 ANS: 3 PTS: 2 REF: 061524geo TOP: Triangle Congruency

124 ANS: 1

$\frac{4}{6} = \frac{3}{4.5} = \frac{2}{3}$

PTS: 2 REF: 081523geo TOP: Dilations

125 ANS: 4 PTS: 2 REF: 011808geo

TOP: Analytical Representations of Transformations KEY: basic

126 ANS: 1

$\tan x = \frac{1}{12}$

$x \approx 4.76$

PTS: 2 REF: 081715geo TOP: Using Trigonometry to Find an Angle

127 ANS: 2 PTS: 2 REF: 081501geo TOP: Special Quadrilaterals

128 ANS: 1

$m_{\overline{RT}} = \frac{5--3}{4--2} = \frac{8}{6} = \frac{4}{3}$ $m_{\overline{ST}} = \frac{5-2}{4-8} = \frac{3}{-4} = -\frac{3}{4}$ Slopes are opposite reciprocals, so lines form a right angle.

PTS: 2 REF: 011618geo TOP: Triangles in the Coordinate Plane

129 ANS: 1

$\frac{1000}{20\pi} \approx 15.9$

PTS: 2 REF: 011623geo TOP: Circumference

130 ANS: 4

$\frac{36}{45} \neq \frac{15}{18}$

$\frac{4}{5} \neq \frac{5}{6}$

PTS: 2 REF: 081709geo STA: G.G.44 TOP: Similarity Proofs

131 ANS: 4

$\frac{2}{4} = \frac{9-x}{x}$

$36 - 4x = 2x$

$x = 6$

PTS: 2 REF: 061705geo TOP: Side Splitter Theorem

132 ANS: 3

$r = \sqrt{(7-3)^2 + (1--2)^2} = \sqrt{16+9} = 5$

PTS: 2 REF: 061503geo TOP: Circles in the Coordinate Plane

133 ANS: 4

$\frac{2}{6} = \frac{5}{15}$

PTS: 2 REF: 081517geo TOP: Side Splitter Theorem

134 ANS: 1

NYSED accepts either (1) or (3) as a correct answer. Statement III is not true if *A, B, A'* and *B'* are collinear.

PTS: 2 REF: 061714geo TOP: Compositions of Transformations

KEY: basic

135 ANS: 1 PTS: 2 REF: 081603geo TOP: Rotations of Two-Dimensional Objects
136 ANS: 4 PTS: 2 REF: 011810geo TOP: Rotations of Two-Dimensional Objects
137 ANS: 2 PTS: 2 REF: 081602geo TOP: Identifying Transformations
KEY: basic
138 ANS: 2 PTS: 2 REF: 081701geo
TOP: Cross-Sections of Three-Dimensional Objects
139 ANS: 4

The segment's midpoint is the origin and slope is –2. The slope of a perpendicular line is $\frac{1}{2}$. $y = \frac{1}{2}x + 0$

$2y = x$

$2y - x = 0$

PTS: 2 REF: 081724geo TOP: Parallel and Perpendicular Lines
KEY: perpendicular bisector
140 ANS: 1

$\frac{360°}{45°} = 8$

PTS: 2 REF: 061510geo TOP: Mapping a Polygon onto Itself
141 ANS: 3 PTS: 2 REF: 081613geo
TOP: Cross-Sections of Three-Dimensional Objects
142 ANS: 4 PTS: 2 REF: 081514geo TOP: Compositions of Transformations
KEY: grids
143 ANS: 2

$V = \frac{1}{3}\left(\frac{36}{4}\right)^2 \cdot 15 = 405$

PTS: 2 REF: 011822geo TOP: Volume KEY: pyramids
144 ANS: 4

$\sin 71 = \frac{x}{20}$

$x = 20 \sin 71 \approx 19$

PTS: 2 REF: 061721geo TOP: Using Trigonometry to Find a Side
KEY: without graphics
145 ANS: 3

$\frac{AB}{BC} = \frac{DE}{EF}$

$\frac{9}{15} = \frac{6}{10}$

$90 = 90$

PTS: 2 REF: 061515geo TOP: Similarity KEY: basic

146 ANS: 4

$x = -6 + \frac{1}{6}(6 - -6) = -6 + 2 = -4 \quad y = -2 + \frac{1}{6}(7 - -2) = -2 + \frac{9}{6} = -\frac{1}{2}$

PTS: 2 REF: 081618geo TOP: Directed Line Segments

147 ANS: 3

NYSED has stated that all students should be awarded credit regardless of their answer to this question.

PTS: 2 REF: 061722geo TOP: Triangle Congruency

148 ANS: 4 PTS: 2 REF: 011723geo

TOP: Cross-Sections of Three-Dimensional Objects

149 ANS: 2

$4 \times 4 \times 6 - \pi(1)^2(6) \approx 77$

PTS: 2 REF: 011711geo TOP: Volume KEY: compositions

150 ANS: 1

$m = \frac{-A}{B} = \frac{-2}{-1} = 2$

$m_{\perp} = -\frac{1}{2}$

PTS: 2 REF: 061509geo TOP: Parallel and Perpendicular Lines

KEY: identify perpendicular lines

151 ANS: 1

$x = -5 + \frac{1}{3}(4 - -5) = -5 + 3 = -2 \quad y = 2 + \frac{1}{3}(-10 - 2) = 2 - 4 = -2$

PTS: 2 REF: 011806geo TOP: Directed Line Segments

152 ANS: 4 PTS: 2 REF: 011705geo TOP: Special Quadrilaterals

153 ANS: 3

$\frac{s_L}{s_S} = \frac{6\theta}{4\theta} = 1.5$

PTS: 2 REF: 011824geo TOP: Arc Length KEY: arc length

154 ANS: 1

$x^2 + y^2 - 12y + 36 = -20 + 36$

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

PTS: 2 REF: 061712geo TOP: Equations of Circles

KEY: completing the square

155 ANS: 3

$5 \cdot \frac{10}{4} = \frac{50}{4} = 12.5$

PTS: 2 REF: 081512geo TOP: Chords, Secants and Tangents

KEY: common tangents

156 ANS: 3

$\frac{7-1}{0-2} = \frac{6}{-2} = -3$ The diagonals of a rhombus are perpendicular.

PTS: 2 REF: 011719geo TOP: Quadrilaterals in the Coordinate Plane

157 ANS: 3 PTS: 2 REF: 011714geo TOP: Trigonometric Ratios

158 ANS: 4 PTS: 2 REF: 081506geo TOP: Dilations

159 ANS: 3 PTS: 2 REF: 011621geo TOP: Chords, Secants and Tangents

KEY: inscribed

160 ANS: 3

1) only proves AA; 2) need congruent legs for HL; 3) SAS; 4) only proves product of altitude and base is equal

PTS: 2 REF: 061607geo TOP: Triangle Proofs

KEY: statements

161 ANS: 3

$A = \frac{1}{2}ab \quad 3-6 = -3 = x$

$24 = \frac{1}{2}a(8) \quad \frac{4+12}{2} = 8 = y$

$a = 6$

PTS: 2 REF: 081615geo TOP: Polygons in the Coordinate Plane

162 ANS: 2

$x^2 = 12(12-8)$

$x^2 = 48$

$x = 4\sqrt{3}$

PTS: 2 REF: 011823geo TOP: Similarity KEY: leg

163 ANS: 1 PTS: 2 REF: 011606geo TOP: Lines and Angles

164 ANS: 2

$6 + 6\sqrt{3} + 6 + 6\sqrt{3} \approx 32.8$

PTS: 2 REF: 011709geo TOP: 30-60-90 Triangles

165 ANS: 4

$-5 + \frac{3}{5}(5 - -5) \quad -4 + \frac{3}{5}(1 - -4)$

$-5 + \frac{3}{5}(10) \qquad -4 + \frac{3}{5}(5)$

$-5 + 6 \qquad -4 + 3$

$1 \qquad -1$

PTS: 2 REF: spr1401geo TOP: Directed Line Segments

166 ANS: 1 PTS: 2 REF: 011814geo TOP: Line Dilations

167 ANS: 1

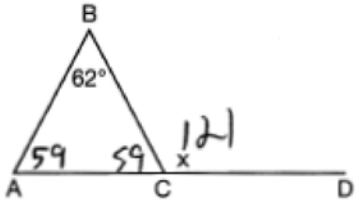
$3^2 = 9$

PTS: 2 REF: 081520geo TOP: Dilations

168 ANS: 3 PTS: 2 REF: 011605geo

TOP: Analytical Representations of Transformations KEY: basic

169 ANS: 4



PTS: 2 REF: 081711geo TOP: Exterior Angle Theorem

170 ANS: 1

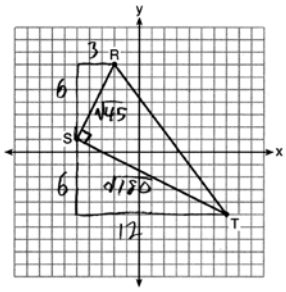
$\frac{64}{4} = 16$ $16^2 = 256$ $2w + 2(w+2) = 64$ $15 \times 17 = 255$ $2w + 2(w+4) = 64$ $14 \times 18 = 252$ $2w + 2(w+6) = 64$

$w = 15$ $w = 14$ $w = 13$

$13 \times 19 = 247$

PTS: 2 REF: 011708geo TOP: Area of Polygons

171 ANS: 3



$\sqrt{45} = 3\sqrt{5}$ $a = \frac{1}{2}\left(3\sqrt{5}\right)\left(6\sqrt{5}\right) = \frac{1}{2}(18)(5) = 45$

$\sqrt{180} = 6\sqrt{5}$

PTS: 2 REF: 061622geo TOP: Polygons in the Coordinate Plane

172 ANS: 4

$3 \times 6 = 18$

PTS: 2 REF: 061602geo TOP: Line Dilations

173 ANS: 1

$\cos S = \frac{60}{65}$

$S \approx 23$

PTS: 2 REF: 061713geo TOP: Using Trigonometry to Find an Angle

174 ANS: 2

$$\frac{\frac{512\pi}{3}}{\left(\frac{32}{2}\right)^2\pi}\cdot 2\pi = \frac{4\pi}{3}$$

PTS: 2 REF: 081723geo TOP: Sectors

175 ANS: 2

$14\times 16\times 10 = 2240$ $\frac{2240-1680}{2240} = 0.25$

PTS: 2 REF: 011604geo TOP: Volume KEY: prisms

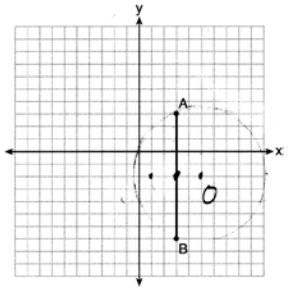
176 ANS: 3

$\cos 40 = \frac{14}{x}$

$x \approx 18$

PTS: 2 REF: 011712geo TOP: Using Trigonometry to Find a Side

177 ANS: 1



Since the midpoint of $\overline{AB}$ is $(3,-2)$, the center must be either $(5,-2)$ or $(1,-2)$.

$r = \sqrt{2^2+5^2} = \sqrt{29}$

PTS: 2 REF: 061623geo TOP: Equations of Circles
KEY: other

178 ANS: 4

$\frac{7}{12}\cdot 30 = 17.5$

PTS: 2 REF: 061521geo TOP: Similarity KEY: perimeter and area

179 ANS: 1

B: $(4-3,3-4) \rightarrow (1,-1) \rightarrow (2,-2) \rightarrow (2+3,-2+4)$

C: $(2-3,1-4) \rightarrow (-1,-3) \rightarrow (-2,-6) \rightarrow (-2+3,-6+4)$

PTS: 2 REF: 011713geo TOP: Line Dilations

180 ANS: 4 PTS: 2 REF: 011803geo TOP: Identifying Transformations
KEY: graphics

181 ANS: 1

$\frac{1}{2}\left(\frac{4}{3}\right)\pi \cdot 5^3 \cdot 62.4 \approx 16{,}336$

PTS: 2 REF: 061620geo TOP: Density

182 ANS: 1

$360 - (82 + 104 + 121) = 53$

PTS: 2 REF: 011801geo TOP: Properties of Transformations
KEY: basic

183 ANS: 3

(3) Could be a trapezoid.

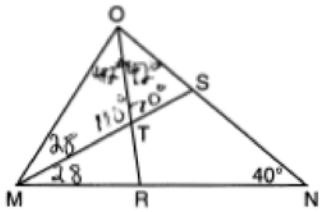
PTS: 2 REF: 081607geo TOP: Parallelograms

184 ANS: 4

$\frac{300}{360} \cdot 8^2\pi = \frac{160\pi}{3}$

PTS: 2 REF: 011721geo TOP: Sectors

185 ANS: 4



PTS: 2 REF: 061717geo TOP: Interior and Exterior Angles of Triangles

186 ANS: 3

In (1) and (2), *ABCD* could be a rectangle with non-congruent sides. (4) is not possible

PTS: 2 REF: 081714geo TOP: Special Quadrilaterals

187 ANS: 2

$x^2 = 3 \cdot 18$

$x = \sqrt{3 \cdot 3 \cdot 6}$

$x = 3\sqrt{6}$

PTS: 2 REF: 081712geo TOP: Chords, Secants and Tangents
KEY: secant and tangent drawn from common point, length

188 ANS: 1

$-8 + \frac{3}{8}(16 - -8) = -8 + \frac{3}{8}(24) = -8 + 9 = 1 \quad -2 + \frac{3}{8}(6 - -2) = -2 + \frac{3}{8}(8) = -2 + 3 = 1$

PTS: 2 REF: 081717geo TOP: Directed Line Segments

189 ANS: 4
The measures of the angles of a triangle remain the same after all rotations because rotations are rigid motions which preserve angle measure.

PTS: 2 REF: fall1402geo TOP: Properties of Transformations
KEY: graphics

190 ANS: 2 PTS: 2 REF: 061603geo TOP: Equations of Circles
KEY: find center and radius | completing the square

191 ANS: 1
$180 - (68 \cdot 2)$

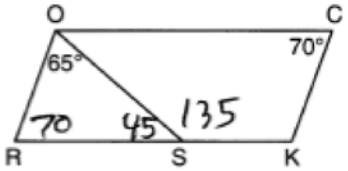
PTS: 2 REF: 081624geo TOP: Interior and Exterior Angles of Polygons

192 ANS: 1
$\sin 32 = \frac{O}{129.5}$

$O \approx 68.6$

PTS: 2 REF: 011804geo TOP: Using Trigonometry to Find a Side

193 ANS: 4



PTS: 2 REF: 081708geo TOP: Interior and Exterior Angles of Polygons

194 ANS: 1
Parallel chords intercept congruent arcs. $\frac{180 - 130}{2} = 25$

PTS: 2 REF: 081704geo TOP: Chords, Secants and Tangents
KEY: parallel lines

195 ANS: 1 PTS: 2 REF: 011601geo
TOP: Cross-Sections of Three-Dimensional Objects

196 ANS: 1
$x^2 - 4x + 4 + y^2 + 8y + 16 = -11 + 4 + 16$

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

PTS: 2 REF: 081616geo TOP: Equations of Circles
KEY: completing the square

197 ANS: 3 PTS: 2 REF: 011710geo TOP: Compositions of Transformations
KEY: identify

198 ANS: 3

$\frac{12}{4} = \frac{x}{5}$ $15 - 4 = 11$

$x = 15$

PTS: 2 REF: 011624geo TOP: Similarity KEY: basic

199 ANS: 1

Illinois: $\frac{12830632}{231.1} \approx 55520$ Florida: $\frac{18801310}{350.6} \approx 53626$ New York: $\frac{19378102}{411.2} \approx 47126$ Pennsylvania: $\frac{12702379}{283.9} \approx 44742$

PTS: 2 REF: 081720geo TOP: Density

200 ANS: 2

$\tan\theta = \frac{2.4}{x}$

$\frac{3}{7} = \frac{2.4}{x}$

$x = 5.6$

PTS: 2 REF: 011707geo TOP: Using Trigonometry to Find a Side

201 ANS: 4 PTS: 2 REF: 081611geo TOP: Lines and Angles

202 ANS: 1

$\sin 32 = \frac{x}{6.2}$

$x \approx 3.3$

PTS: 2 REF: 081719geo TOP: Using Trigonometry to Find a Side

203 ANS: 2

$s^2 + s^2 = 7^2$

$2s^2 = 49$

$s^2 = 24.5$

$s \approx 4.9$

PTS: 2 REF: 081511geo TOP: Pythagorean Theorem

204 ANS: 2 PTS: 2 REF: 011702geo TOP: Compositions of Transformations KEY: basic

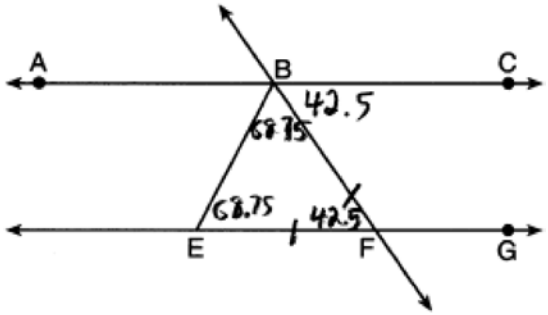
205 ANS: 4 PTS: 2 REF: 081716geo TOP: Midsegments

206 ANS: 4 PTS: 2 REF: 061615geo TOP: Trigonometric Ratios

207 ANS: 3 PTS: 2 REF: 061616geo TOP: Identifying Transformations KEY: graphics

208 ANS: 1 PTS: 2 REF: 061604geo TOP: Identifying Transformations KEY: graphics

209 ANS: 2



PTS: 2 REF: 011818geo TOP: Lines and Angles

210 ANS: 2

$$\frac{12}{4} = \frac{36}{x}$$

$$12x = 144$$

$$x = 12$$

PTS: 2 REF: 061621geo TOP: Side Splitter Theorem

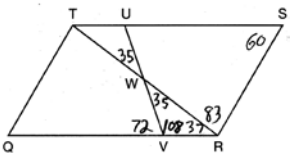
211 ANS: 3 PTS: 2 REF: 061601geo TOP: Rotations of Two-Dimensional Objects

212 ANS: 4

$$\frac{1}{2}(360 - 268) = 46$$

PTS: 2 REF: 061704geo TOP: Chords, Secants and Tangents
KEY: inscribed

213 ANS: 3



PTS: 2 REF: 011603geo TOP: Interior and Exterior Angles of Polygons

214 ANS: 3

The x-axis and line $x = 4$ are lines of symmetry and $(4, 0)$ is a point of symmetry.

PTS: 2 REF: 081706geo TOP: Mapping a Polygon onto Itself

215 ANS: 2

$$V = \frac{1}{3} \cdot 6^2 \cdot 12 = 144$$

PTS: 2 REF: 011607geo TOP: Volume KEY: pyramids

216 ANS: 3

$\sqrt{20^2 - 10^2} \approx 17.3$

PTS: 2 REF: 081608geo TOP: Pythagorean Theorem
KEY: without graphics

217 ANS: 1

The other statements are true only if $\overline{AD} \perp \overline{BC}$.

PTS: 2 REF: 081623geo TOP: Chords, Secants and Tangents
KEY: inscribed

218 ANS: 1

$$V = \frac{\frac{4}{3}\pi\left(\frac{10}{2}\right)^3}{2} \approx 261.8 \cdot 62.4 = 16{,}336$$

PTS: 2 REF: 081516geo TOP: Density

219 ANS: 2

$6 \cdot 6 = x(x - 5)$

$36 = x^2 - 5x$

$0 = x^2 - 5x - 36$

$0 = (x - 9)(x + 4)$

$x = 9$

PTS: 2 REF: 061708geo TOP: Chords, Secants and Tangents
KEY: intersecting chords, length

220 ANS: 4 PTS: 2 REF: 011817geo TOP: Similarity
KEY: basic

221 ANS: 1 PTS: 2 REF: 081505geo TOP: Mapping a Polygon onto Itself

222 ANS: 2

$x^2 = 4 \cdot 10$

$x = \sqrt{40}$

$x = 2\sqrt{10}$

PTS: 2 REF: 081610geo TOP: Similarity KEY: leg

223 ANS: 3 PTS: 2 REF: 061702geo TOP: Polygons in the Coordinate Plane

Geometry Common Core State Standards 2 Point Regents Exam Questions
Answer Section

224 ANS:
If an altitude is drawn to the hypotenuse of a triangle, it divides the triangle into two right triangles similar to each other and the original triangle.

PTS: 2 REF: 061729geo TOP: Similarity KEY: altitude

225 ANS:
$\ell: y = 3x - 4$

$m: y = 3x - 8$

PTS: 2 REF: 011631geo TOP: Line Dilations

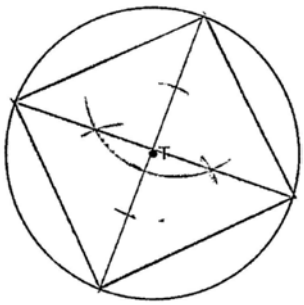
226 ANS:
The transformation is a rotation, which is a rigid motion.

PTS: 2 REF: 081530geo TOP: Triangle Congruency

227 ANS:
$T_{0,-2} \circ r_{y\text{-axis}}$

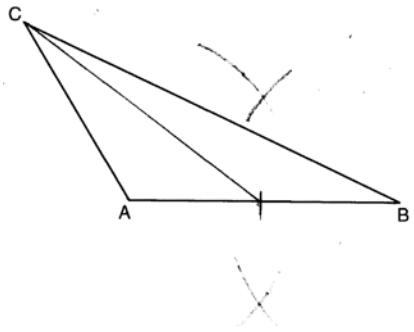
PTS: 2 REF: 011726geo TOP: Compositions of Transformations
KEY: identify

228 ANS:



PTS: 2 REF: 061525geo TOP: Constructions

229 ANS:



PTS: 2 REF: 081628geo TOP: Constructions
KEY: line bisector

230 ANS:

$R_{180°}$ about $\left(-\frac{1}{2}, \frac{1}{2}\right)$

PTS: 2 REF: 081727geo TOP: Compositions of Transformations
KEY: identify

231 ANS:

Triangle $X'Y'Z'$ is the image of $\triangle XYZ$ after a rotation about point Z such that $\overline{ZX}$ coincides with $\overline{ZU}$. Since rotations preserve angle measure, $\overline{ZY}$ coincides with $\overline{ZV}$, and corresponding angles X and Y, after the rotation, remain congruent, so $\overline{XY} \parallel \overline{UV}$. Then, dilate $\triangle X'Y'Z'$ by a scale factor of $\frac{ZU}{ZX}$ with its center at point Z. Since dilations preserve parallelism, $\overline{XY}$ maps onto $\overline{UV}$. Therefore, $\triangle XYZ \sim \triangle UVZ$.

PTS: 2 REF: spr1406geo TOP: Compositions of Transformations
KEY: grids

232 ANS:

Yes. The sequence of transformations consists of a reflection and a translation, which are isometries which preserve distance and congruency.

PTS: 2 REF: 011628geo TOP: Triangle Congruency

233 ANS:

Each quarter in both stacks has the same base area. Therefore, each corresponding cross-section of the stacks will have the same area. Since the two stacks of quarters have the same height of 23 quarters, the two volumes must be the same.

PTS: 2 REF: spr1405geo TOP: Volume

234 ANS:

$$\frac{120}{230} = \frac{x}{315}$$

$$x = 164$$

PTS: 2 REF: 081527geo TOP: Similarity KEY: basic

235 ANS:

$4 + \frac{4}{9}(22-4)$ $2 + \frac{4}{9}(2-2)$ $(12,2)$

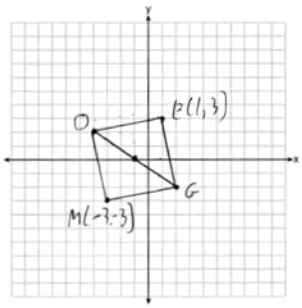
$4 + \frac{4}{9}(18)$ $2 + \frac{4}{9}(0)$

$4 + 8$ $2 + 0$

12 2

PTS: 2 REF: 061626geo TOP: Directed Line Segments

236 ANS:



PTS: 2 REF: 011731geo TOP: Quadrilaterals in the Coordinate Plane
KEY: grids

237 ANS:

$$\sin x = \frac{4.5}{11.75}$$

$$x \approx 23$$

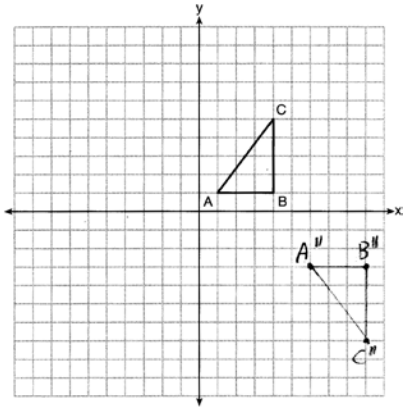
PTS: 2 REF: 061528geo TOP: Using Trigonometry to Find an Angle

238 ANS:

$$500 \times 1015 \text{ cc} \times \frac{\$0.29}{\text{kg}} \times \frac{7.95 \text{ g}}{\text{cc}} \times \frac{1 \text{ kg}}{1000 \text{ g}} = \$1170$$

PTS: 2 REF: 011829geo TOP: Density

239 ANS:



PTS: 2 REF: 081626geo TOP: Compositions of Transformations
KEY: grids

240 ANS:

Parallelogram *ABCD* with diagonal $\overline{AC}$ drawn (given). $\overline{AC} \cong \overline{AC}$ (reflexive property). $\overline{AD} \cong \overline{CB}$ and $\overline{BA} \cong \overline{DC}$ (opposite sides of a parallelogram are congruent). $\triangle ABC \cong \triangle CDA$ (SSS).

PTS: 2 REF: 011825geo TOP: Quadrilateral Proofs

241 ANS:

Yes. $\angle A \cong \angle X$, $\angle C \cong \angle Z$, $\overline{AC} \cong \overline{XZ}$ after a sequence of rigid motions which preserve distance and angle measure, so $\triangle ABC \cong \triangle XYZ$ by ASA. $\overline{BC} \cong \overline{YZ}$ by CPCTC.

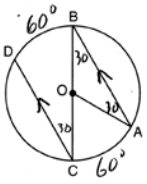
PTS: 2 REF: 081730geo TOP: Triangle Congruency

242 ANS:

Each triangular prism has the same base area. Therefore, each corresponding cross-section of the prisms will have the same area. Since the two prisms have the same height of 14, the two volumes must be the same.

PTS: 2 REF: 061727geo TOP: Volume

243 ANS:



$180 - 2(30) = 120$

PTS: 2 REF: 011626geo TOP: Chords, Secants and Tangents
KEY: parallel lines

244 ANS:

$\cos B$ increases because $\angle A$ and $\angle B$ are complementary and $\sin A = \cos B$.

PTS: 2 REF: 011827geo TOP: Cofunctions

245 ANS:

Yes. The bases of the cylinders have the same area and the cylinders have the same height.

PTS: 2 REF: 081725geo TOP: Volume

246 ANS:

$x^2 - 6x + 9 + y^2 + 8y + 16 = 56 + 9 + 16$ $(3, -4)$; $r = 9$

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

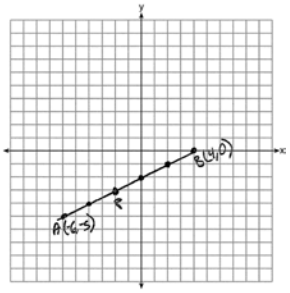
PTS: 2 REF: 081731geo TOP: Equations of Circles
KEY: completing the square

247 ANS:

Circle A can be mapped onto circle B by first translating circle A along vector $\overline{AB}$ such that A maps onto B, and then dilating circle A, centered at A, by a scale factor of $\frac{5}{3}$. Since there exists a sequence of transformations that maps circle A onto circle B, circle A is similar to circle B.

PTS: 2 REF: spr1404geo TOP: Similarity Proofs

248 ANS:



$-6+\frac{2}{5}(4--6)$ $-5+\frac{2}{5}(0--5)$ $(-2,-3)$

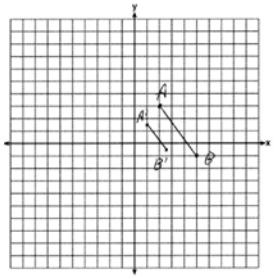
$-6+\frac{2}{5}(10)$ $-5+\frac{2}{5}(5)$

$-6+4$ $-5+2$

-2 -3

PTS: 2 REF: 061527geo TOP: Directed Line Segments

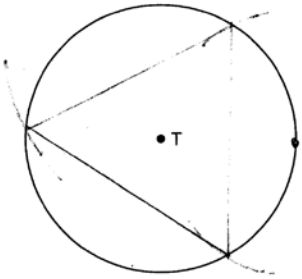
249 ANS:



$\sqrt{(2.5-1)^2+(-.5-1.5)^2} = \sqrt{2.25+4} = 2.5$

PTS: 2 REF: 081729geo TOP: Dilations

250 ANS:



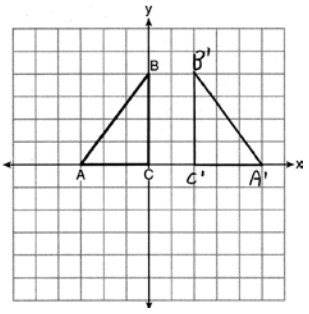
PTS: 2 REF: 081526geo TOP: Constructions

251 ANS:

$\frac{40}{360} \cdot \pi(4.5)^2 = 2.25\pi$

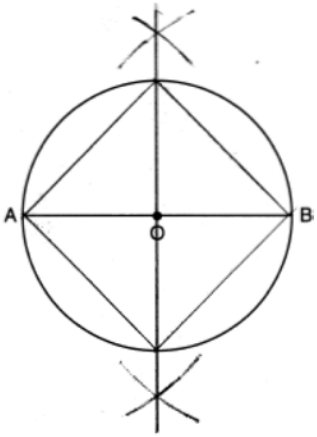
PTS: 2 REF: 061726geo TOP: Sectors

252 ANS:



PTS: 2 REF: 011625geo TOP: Reflections KEY: grids

253 ANS:



PTS: 2 REF: 011826geo TOP: Constructions

254 ANS:

Rotate $\triangle ABC$ clockwise about point C until $\overline{DF} \parallel \overline{AC}$. Translate $\triangle ABC$ along $\overline{CF}$ so that C maps onto F.

PTS: 2 REF: 061730geo TOP: Compositions of Transformations
KEY: identify

255 ANS:

No. Since $\overline{BC} = 5$ and $\overline{ST} = \sqrt{18}$ are not congruent, the two triangles are not congruent. Since rigid motions preserve distance, there is no rigid motion that maps $\triangle ABC$ onto $\triangle RST$.

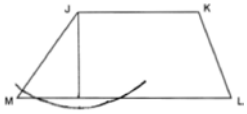
PTS: 2 REF: 011830geo TOP: Triangle Congruency

256 ANS:

$\frac{2}{5} \cdot (16-1) = 6 \quad \frac{2}{5} \cdot (14-4) = 4 \quad (1+6, 4+4) = (7,8)$

PTS: 2 REF: 081531geo TOP: Directed Line Segments

257 ANS:



PTS: 2 REF: 061725geo TOP: Constructions
KEY: parallel and perpendicular lines

258 ANS:
Yes, because 28º and 62º angles are complementary. The sine of an angle equals the cosine of its complement.

PTS: 2 REF: 011727geo TOP: Cofunctions

259 ANS:
$73 + R = 90$ Equal cofunctions are complementary.

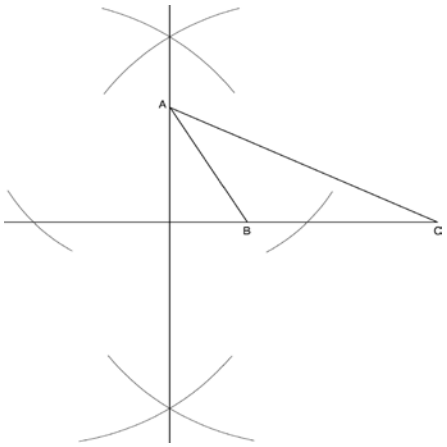
$R = 17$

PTS: 2 REF: 061628geo TOP: Cofunctions

260 ANS:
$\triangle MNO$ is congruent to $\triangle PNO$ by SAS. Since $\triangle MNO \cong \triangle PNO$, then $\overline{MO} \cong \overline{PO}$ by CPCTC. So $\overline{NO}$ must divide $\overline{MP}$ in half, and $MO = 8$.

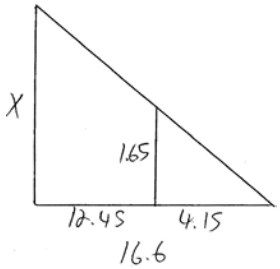
PTS: 2 REF: fall1405geo TOP: Isosceles Triangle Theorem

261 ANS:



PTS: 2 REF: fall1409geo TOP: Constructions
KEY: parallel and perpendicular lines

262 ANS:



$$\frac{1.65}{4.15} = \frac{x}{16.6}$$

$$4.15x = 27.39$$

$$x = 6.6$$

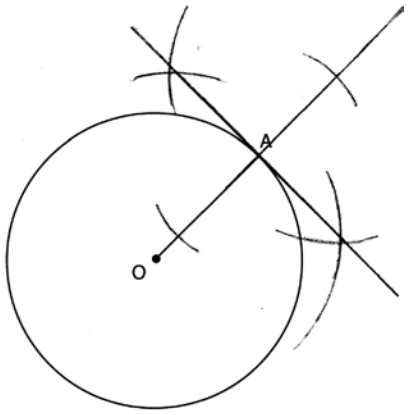
PTS: 2 REF: 061531geo TOP: Similarity KEY: basic

263 ANS:

$$\frac{152 - 56}{2} = 48$$

PTS: 2 REF: 011728geo TOP: Chords, Secants and Tangents
KEY: secant and tangent drawn from common point, angle

264 ANS:



PTS: 2 REF: 061631geo TOP: Constructions
KEY: parallel and perpendicular lines

265 ANS:

$$\cos W = \frac{6}{18}$$

$$W \approx 71$$

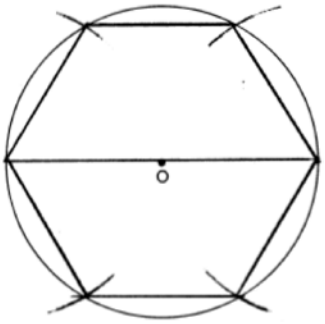
PTS: 2 REF: 011831geo TOP: Using Trigonometry to Find an Angle

266 ANS:

$$\sqrt[3]{\frac{3V_f}{4\pi}} - \sqrt[3]{\frac{3V_p}{4\pi}} = \sqrt[3]{\frac{3(294)}{4\pi}} - \sqrt[3]{\frac{3(180)}{4\pi}} \approx 0.6$$

PTS: 2 REF: 061728geo TOP: Volume KEY: spheres

267 ANS:



PTS: 2 REF: 081728geo TOP: Constructions

268 ANS:

No, the weight of the bricks is greater than 900 kg. $500 \times (5.1\,\text{cm} \times 10.2\,\text{cm} \times 20.3\,\text{cm}) = 528{,}003\,\text{cm}^3$.

$528{,}003\,\text{cm}^3 \times \dfrac{1\,\text{m}^3}{100\ \text{cm}^3} = 0.528003\,\text{m}^3$. $\dfrac{1920\,\text{kg}}{\text{m}^3} \times 0.528003\,\text{m}^3 \approx 1013\,\text{kg}$.

PTS: 2 REF: fall1406geo TOP: Density

269 ANS:

$M = 180 - (47 + 57) = 76$ Rotations do not change angle measurements.

PTS: 2 REF: 081629geo TOP: Properties of Transformations

270 ANS:

$\dfrac{40000}{\pi\left(\frac{51}{2}\right)^2} \approx 19.6$ $\dfrac{72000}{\pi\left(\frac{75}{2}\right)^2} \approx 16.3$ Dish A

PTS: 2 REF: 011630geo TOP: Density

271 ANS:

The four small triangles are 8-15-17 triangles. $4 \times 17 = 68$

PTS: 2 REF: 081726geo TOP: Special Quadrilaterals

272 ANS:

$\sin 70 = \dfrac{30}{L}$

$L \approx 32$

PTS: 2 REF: 011629geo TOP: Using Trigonometry to Find a Side
KEY: graphics

273 ANS:

$\tan x = \dfrac{10}{4}$

$x \approx 68$

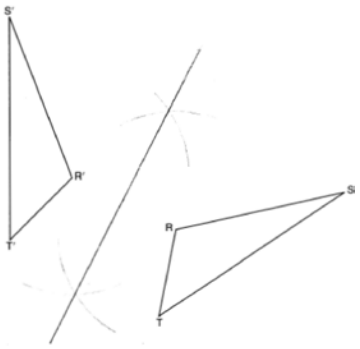
PTS: 2 REF: 061630geo TOP: Using Trigonometry to Find an Angle

274 ANS:

Translate $\triangle ABC$ along $\overline{CF}$ such that point C maps onto point F, resulting in image $\triangle A'B'C'$. Then reflect $\triangle A'B'C'$ over $\overline{DF}$ such that $\triangle A'B'C'$ maps onto $\triangle DEF$.
or
Reflect $\triangle ABC$ over the perpendicular bisector of $\overline{EB}$ such that $\triangle ABC$ maps onto $\triangle DEF$.

PTS: 2 REF: fall1408geo TOP: Triangle Congruency

275 ANS:



PTS: 2 REF: 011725geo TOP: Constructions
KEY: line bisector

276 ANS:

Reflections are rigid motions that preserve distance.

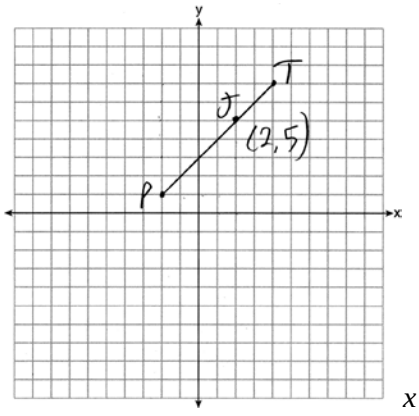
PTS: 2 REF: 061530geo TOP: Triangle Congruency

277 ANS:

$\frac{137.8}{6^3} \approx 0.638$ Ash

PTS: 2 REF: 081525geo TOP: Density

278 ANS:



$x = \frac{2}{3}(4 - -2) = 4 \quad -2 + 4 = 2 \quad J(2,5)$

$y = \frac{2}{3}(7 - 1) = 4 \qquad 1 + 4 = 5$

PTS: 2 REF: 011627geo TOP: Directed Line Segments

279 ANS:

$s = \theta \cdot r$ $s = \theta \cdot r$ Yes, both angles are equal.

$\pi = A \cdot 4$ $\frac{13\pi}{8} = B \cdot 6.5$

$\frac{\pi}{4} = A$ $\frac{\pi}{4} = B$

PTS: 2 REF: 061629geo TOP: Arc Length KEY: arc length

280 ANS:

$\frac{360}{6} = 60$

PTS: 2 REF: 081627geo TOP: Mapping a Polygon onto Itself

281 ANS:

$180 - 2(25) = 130$

PTS: 2 REF: 011730geo TOP: Isosceles Triangle Theorem

282 ANS:

$\frac{3}{8} \cdot 56 = 21$

PTS: 2 REF: 081625geo TOP: Chords, Secants and Tangents
KEY: common tangents

283 ANS:

Yes. $(x-1)^2 + (y+2)^2 = 4^2$

$(3.4-1)^2 + (1.2+2)^2 = 16$

$5.76 + 10.24 = 16$

$16 = 16$

PTS: 2 REF: 081630geo TOP: Circles in the Coordinate Plane

284 ANS:

$4x - .07 = 2x + .01$ Sin$A$ is the ratio of the opposite side and the hypotenuse while $\cos B$ is the ratio of the adjacent

$2x = 0.8$

$x = 0.4$

side and the hypotenuse. The side opposite angle A is the same side as the side adjacent to angle B. Therefore, $\sin A = \cos B$.

PTS: 2 REF: fall1407geo TOP: Cofunctions

285 ANS:

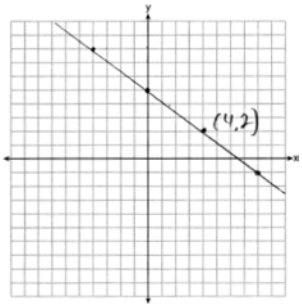
$\sin 75 = \frac{15}{x}$

$x = \frac{15}{\sin 75}$

$x \approx 15.5$

PTS: 2 REF: 081631geo TOP: Using Trigonometry to Find a Side
KEY: graphics

286 ANS:



The line is on the center of dilation, so the line does not change. $p: 3x + 4y = 20$

PTS: 2 REF: 061731geo TOP: Line Dilations

287 ANS:

$\overline{GI}$ is parallel to $\overline{NT}$, and $\overline{IN}$ intersects at A (given); $\angle I \cong \angle N$, $\angle G \cong \angle T$ (paralleling lines cut by a transversal form congruent alternate interior angles); $\triangle GIA \sim \triangle TNA$ (AA).

PTS: 2 REF: 011729geo TOP: Similarity Proofs

288 ANS:

Opposite angles in a parallelogram are congruent, so $m\angle O = 118°$. The interior angles of a triangle equal 180°. $180 - (118 + 22) = 40$.

PTS: 2 REF: 061526geo TOP: Interior and Exterior Angles of Polygons

289 ANS:

$A = 6^2 \pi = 36\pi \quad 36\pi \cdot \frac{x}{360} = 12\pi$

$x = 360 \cdot \frac{12}{36}$

$x = 120$

PTS: 2 REF: 061529geo TOP: Sectors

290 ANS:

$\frac{3.75}{5} = \frac{4.5}{6}$ $\overline{AB}$ is parallel to $\overline{CD}$ because $\overline{AB}$ divides the sides proportionately.

$39.375 = 39.375$

PTS: 2 REF: 061627geo TOP: Side Splitter Theorem

291 ANS:
$T_{6,0} \circ r_{x\text{-axis}}$

PTS: 2 REF: 061625geo TOP: Compositions of Transformations
KEY: identify

292 ANS:
The acute angles in a right triangle are always complementary. The sine of any acute angle is equal to the cosine of its complement.

PTS: 2 REF: spr1407geo TOP: Cofunctions

293 ANS:
$\frac{6}{14} = \frac{9}{21}$ SAS

$126 = 126$

PTS: 2 REF: 081529geo TOP: Similarity KEY: basic

294 ANS:
Parallelogram *ABCD*, diagonals $\overline{AC}$ and $\overline{BD}$ intersect at *E* (given). $\overline{DC} \parallel \overline{AB}$; $\overline{DA} \parallel \overline{CB}$ (opposite sides of a parallelogram are parallel). $\angle ACD \cong \angle CAB$ (alternate interior angles formed by parallel lines and a transversal are congruent).

PTS: 2 REF: 081528geo TOP: Quadrilateral Proofs

295 ANS:
$\frac{Q}{360}(\pi)\left(25^2\right) = (\pi)\left(25^2\right) - 500\pi$

$Q = \frac{125\pi(360)}{625\pi}$

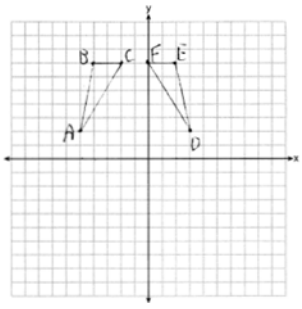
$Q = 72$

PTS: 2 REF: 011828geo TOP: Sectors

Geometry Common Core State Standards 4 Point Regents Exam Questions

Answer Section

296 ANS:



$r_{x=-1}$ Reflections are rigid motions that preserve distance, so $\triangle ABC \cong \triangle DEF$.

PTS: 4 REF: 061732geo TOP: Identifying Transformations
KEY: graphics

297 ANS:

$r = 25\,\text{cm}\left(\frac{1\,\text{m}}{100\,\text{cm}}\right) = 0.25\,\text{m}$ $V = \pi(0.25\,\text{m})^2(10\,\text{m}) = 0.625\pi\,\text{m}^3$ $W = 0.625\pi\,\text{m}^3\left(\frac{380\,\text{K}}{1\,\text{m}^3}\right) \approx 746.1\,K$

$n = \frac{\$50{,}000}{\left(\frac{\$4.75}{\text{K}}\right)(746.1\,\text{K})} = 14.1$ 15 trees

PTS: 4 REF: spr1412geo TOP: Density

298 ANS:

Since linear angles are supplementary, $m\angle GIH = 65°$. Since $\overline{GH} \cong \overline{IH}$, $m\angle GHI = 50°$ $(180 - (65 + 65))$. Since $\angle EGB \cong \angle GHI$, the corresponding angles formed by the transversal and lines are congruent and $\overline{AB} \parallel \overline{CD}$.

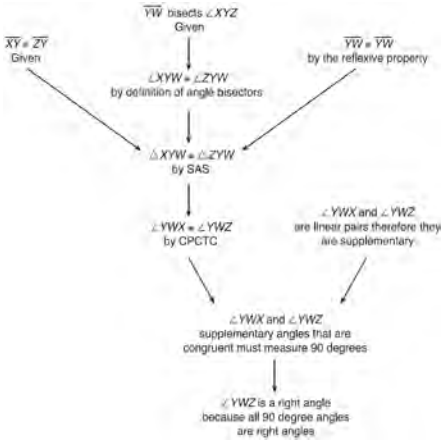
PTS: 4 REF: 061532geo TOP: Lines and Angles

299 ANS:

Translations preserve distance. If point *D* is mapped onto point *A*, point *F* would map onto point *C*. $\triangle DEF \cong \triangle ABC$ as $\overline{AC} \cong \overline{DF}$ and points are collinear on line ℓ and a reflection preserves distance.

PTS: 4 REF: 081534geo TOP: Triangle Congruency

300 ANS:



$\triangle XYZ$, $\overline{XY} \cong \overline{ZY}$, and $\overline{YW}$ bisects $\angle XYZ$ (Given). $\triangle XYZ$ is isosceles (Definition of isosceles triangle). $\overline{YW}$ is an altitude of $\triangle XYZ$ (The angle bisector of the vertex of an isosceles triangle is also the altitude of that triangle). $\overline{YW} \perp \overline{XZ}$ (Definition of altitude). $\angle YWZ$ is a right angle (Definition of perpendicular lines).

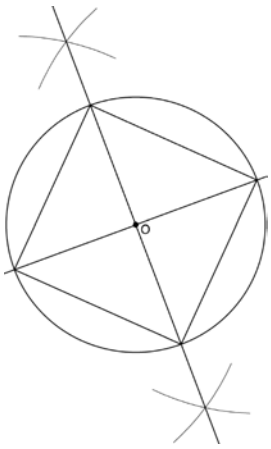
PTS: 4 REF: spr1411geo TOP: Triangle Proofs

301 ANS:

A dilation of $\frac{5}{2}$ about the origin. Dilations preserve angle measure, so the triangles are similar by AA.

PTS: 4 REF: 061634geo TOP: Similarity Proofs

302 ANS:



Since the square is inscribed, each vertex of the square is on the circle and the diagonals of the square are diameters of the circle. Therefore, each angle of the square is an inscribed angle in the circle that intercepts the circle at the endpoints of the diameters. Each angle of the square, which is an inscribed angle, measures 90 degrees. Therefore, the measure of the arc intercepted by two adjacent sides of the square is 180 degrees because it is twice the measure of its inscribed angle.

PTS: 4 REF: fall1412geo TOP: Constructions

303 ANS:

$$\frac{\left(\frac{180-20}{2}\right)}{360} \times \pi(6)^2 = \frac{80}{360} \times 36\pi = 8\pi$$

PTS: 4 REF: spr1410geo TOP: Sectors

304 ANS:

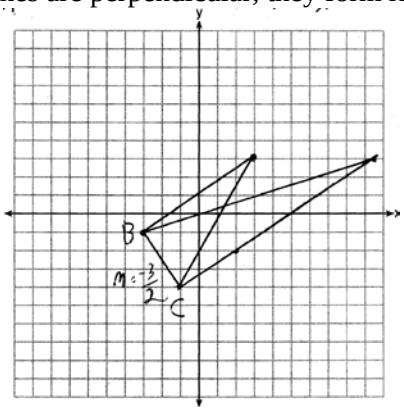
$\tan 7 = \frac{125}{x}$ $\tan 16 = \frac{125}{y}$ $1018 - 436 \approx 582$

$x \approx 1018$ $y \approx 436$

PTS: 4 REF: 081532geo TOP: Using Trigonometry to Find a Side
KEY: advanced

305 ANS:

The slopes of perpendicular line are opposite reciprocals. Since the lines are perpendicular, they form right angles and a right triangle. $m_{\overline{BC}} = -\frac{3}{2}$ $-1 = \frac{2}{3}(-3) + b$ or $-4 = \frac{2}{3}(-1) + b$



$m_{\perp} = \frac{2}{3}$

$-1 = -2 + b$

$1 = b$

$3 = \frac{2}{3}x + 1$

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

$3 = x$

$\frac{-12}{3} = \frac{-2}{3} + b$

$-\frac{10}{3} = b$

$3 = \frac{2}{3}x - \frac{10}{3}$

$9 = 2x - 10$

$19 = 2x$

$9.5 = x$

PTS: 4 REF: 081533geo TOP: Triangles in the Coordinate Plane

306 ANS:

$20000\,\text{g}\left(\frac{1\,\text{ft}^3}{7.48\,\text{g}}\right) = 2673.8\,\text{ft}^3$ $2673.8 = \pi r^2(34.5)$ $9.9 + 1 = 10.9$

$r \approx 4.967$

$d \approx 9.9$

PTS: 4 REF: 061734geo TOP: Volume KEY: cylinders

307 ANS:

As the sum of the measures of the angles of a triangle is 180°, $m\angle ABC + m\angle BCA + m\angle CAB = 180°$. Each interior angle of the triangle and its exterior angle form a linear pair. Linear pairs are supplementary, so $m\angle ABC + m\angle FBC = 180°$, $m\angle BCA + m\angle DCA = 180°$, and $m\angle CAB + m\angle EAB = 180°$. By addition, the sum of these linear pairs is 540°. When the angle measures of the triangle are subtracted from this sum, the result is 360°, the sum of the exterior angles of the triangle.

PTS: 4 REF: fall1410geo TOP: Triangle Proofs

308 ANS:

$\frac{\pi \cdot 11.25^2 \cdot 33.5}{231} \approx 57.7$

PTS: 4 REF: 061632geo TOP: Volume KEY: cylinders

309 ANS:

$\overline{RS}$ and $\overline{TV}$ bisect each other at point *X;* $\overline{TR}$ and $\overline{SV}$ are drawn (given); $\overline{TX} \cong \overline{XV}$ and $\overline{RX} \cong \overline{XS}$ (segment bisectors create two congruent segments); $\angle TXR \cong \angle VXS$ (vertical angles are congruent); $\triangle TXR \cong \triangle VXS$ (SAS); $\angle T \cong \angle V$ (CPCTC); $\overline{TR} \parallel \overline{SV}$ (a transversal that creates congruent alternate interior angles cuts parallel lines).

PTS: 4 REF: 061733geo TOP: Triangle Proofs
KEY: proof

310 ANS:

$V = (\pi)(4^2)(9) + \left(\frac{1}{2}\right)\left(\frac{4}{3}\right)(\pi)\left(4^3\right) \approx 586$

PTS: 4 REF: 011833geo TOP: Volume KEY: compositions

311 ANS:

Circle *O*, tangent $\overline{EC}$ to diameter $\overline{AC}$, chord $\overline{BC} \parallel$ secant $\overline{ADE}$, and chord $\overline{AB}$ (given); $\angle B$ is a right angle (an angle inscribed in a semi-circle is a right angle); $\overleftrightarrow{EC} \perp \overline{OC}$ (a radius drawn to a point of tangency is perpendicular to the tangent); $\angle ECA$ is a right angle (perpendicular lines form right angles); $\angle B \cong \angle ECA$ (all right angles are congruent); $\angle BCA \cong \angle CAE$ (the transversal of parallel lines creates congruent alternate interior angles); $\triangle ABC \sim \triangle ECA$ (AA); $\frac{BC}{CA} = \frac{AB}{EC}$ (Corresponding sides of similar triangles are in proportion).

PTS: 4 REF: 081733geo TOP: Circle Proofs

312 ANS:

$\cos 54 = \frac{4.5}{m}$ $\tan 54 = \frac{h}{4.5}$

$m \approx 7.7$ $h \approx 6.2$

PTS: 4 REF: 011834geo TOP: Using Trigonometry to Find a Side

313 ANS:

$M\left(\frac{4+0}{2}, \frac{6-1}{2}\right) = M\left(2, \frac{5}{2}\right)$ $m = \frac{6--1}{4-0} = \frac{7}{4}$ $m_{\perp} = -\frac{4}{7}$ $y - 2.5 = -\frac{4}{7}(x-2)$ The diagonals, $\overline{MT}$ and $\overline{AH}$, of rhombus *MATH* are perpendicular bisectors of each other.

PTS: 4 REF: fall1411geo TOP: Quadrilaterals in the Coordinate Plane
KEY: grids

314 ANS:

$\frac{16}{9} = \frac{x}{20.6}$ $D = \sqrt{36.6^2 + 20.6^2} \approx 42$

$x \approx 36.6$

PTS: 4 REF: 011632geo TOP: Pythagorean Theorem
KEY: without graphics

315 ANS:

$x^2 + x^2 = 58^2$ $A = (\sqrt{1682} + 8)^2 \approx 2402.2$

$2x^2 = 3364$

$x = \sqrt{1682}$

PTS: 4 REF: 081734geo TOP: Area of Polygons

316 ANS:

$\overline{LA} \cong \overline{DN}$, $\overline{CA} \cong \overline{CN}$, and $\overline{DAC} \perp \overline{LCN}$ (Given). $\angle LCA$ and $\angle DCN$ are right angles (Definition of perpendicular lines). $\triangle LAC$ and $\triangle DNC$ are right triangles (Definition of a right triangle). $\triangle LAC \cong \triangle DNC$ (HL). $\triangle LAC$ will map onto $\triangle DNC$ after rotating $\triangle LAC$ counterclockwise 90° about point *C* such that point *L* maps onto point *D*.

PTS: 4 REF: spr1408geo TOP: Triangle Congruency

317 ANS:

$\tan x = \frac{12}{75}$ $\tan y = \frac{72}{75}$ $43.83 - 9.09 \approx 34.7$

$x \approx 9.09$ $y \approx 43.83$

PTS: 4 REF: 081634geo TOP: Using Trigonometry to Find an Angle

318 ANS:

Parallelogram *ABCD*, $\overline{EFG}$, and diagonal $\overline{DFB}$ (given); $\angle DFE \cong \angle BFG$ (vertical angles); $\overline{AD} \parallel \overline{CB}$ (opposite sides of a parallelogram are parallel); $\angle EDF \cong \angle GBF$ (alternate interior angles are congruent); $\triangle DEF \sim \triangle BGF$ (AA).

PTS: 4 REF: 061633geo TOP: Similarity Proofs

319 ANS:

$x = \sqrt{.55^2 - .25^2} \cong 0.49$ No, $.49^2 = .25y$ $.9604 + .25 < 1.5$

$.9604 = y$

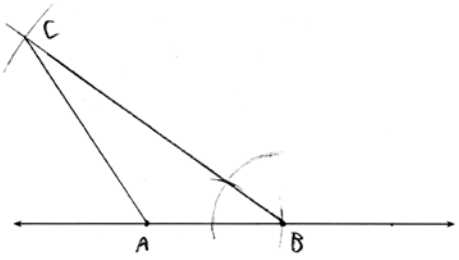
PTS: 4 REF: 061534geo TOP: Similarity KEY: leg

320 ANS:

Quadrilateral *ABCD* is a parallelogram with diagonals $\overline{AC}$ and $\overline{BD}$ intersecting at *E* (Given). $\overline{AD} \cong \overline{BC}$ (Opposite sides of a parallelogram are congruent). $\angle AED \cong \angle CEB$ (Vertical angles are congruent). $\overline{BC} \parallel \overline{DA}$ (Definition of parallelogram). $\angle DBC \cong \angle BDA$ (Alternate interior angles are congruent). $\triangle AED \cong \triangle CEB$ (AAS). 180° rotation of $\triangle AED$ around point *E*.

PTS: 4 REF: 061533geo TOP: Quadrilateral Proofs

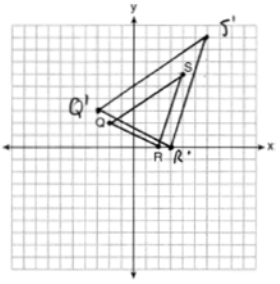
321 ANS:



SAS ≅ SAS

PTS: 4 REF: 011634geo TOP: Constructions
KEY: congruent and similar figures

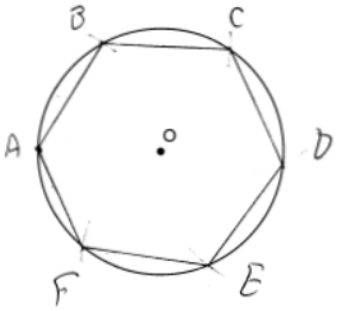
322 ANS:



A dilation preserves slope, so the slopes of $\overline{QR}$ and $\overline{Q'R'}$ are equal. Because the slopes are equal, $Q'R' \parallel QR$.

PTS: 4 REF: 011732geo TOP: Dilations KEY: grids

323 ANS:



Right triangle because $\angle CBF$ is inscribed in a semi-circle.

PTS: 4 REF: 011733geo TOP: Constructions

324 ANS:

(2) Euclid's Parallel Postulate; (3) Alternate interior angles formed by parallel lines and a transversal are congruent; (4) Angles forming a line are supplementary; (5) Substitution

PTS: 4 REF: 011633geo TOP: Triangle Proofs

325 ANS:

A dilation of 3 centered at *A*. A dilation preserves angle measure, so the triangles are similar.

PTS: 4 REF: 011832geo TOP: Dilations

326 ANS:

$C = 2\pi r \quad V = \frac{1}{3}\pi \cdot 5^2 \cdot 13 \approx 340$

$31.416 = 2\pi r$

$5 \approx r$

PTS: 4 REF: 011734geo TOP: Volume KEY: cones

327 ANS:

x represents the distance between the lighthouse and the canoe at 5:00; *y* represents the distance between the lighthouse and the canoe at 5:05. $\tan 6 = \frac{112 - 1.5}{x} \quad \tan(49 + 6) = \frac{112 - 1.5}{y} \quad \frac{1051.3 - 77.4}{5} \approx 195$

$x \approx 1051.3 \qquad y \approx 77.4$

PTS: 4 REF: spr1409geo TOP: Using Trigonometry to Find a Side
KEY: advanced

328 ANS:

ABC – point of reflection $\rightarrow (-y, x)$ + point of reflection $\quad \triangle DEF \cong \triangle A'B'C'$ because $\triangle DEF$ is a reflection of

$A(2,-3) - (2,-3) = (0,0) \rightarrow (0,0) + (2,-3) = A'(2,-3)$

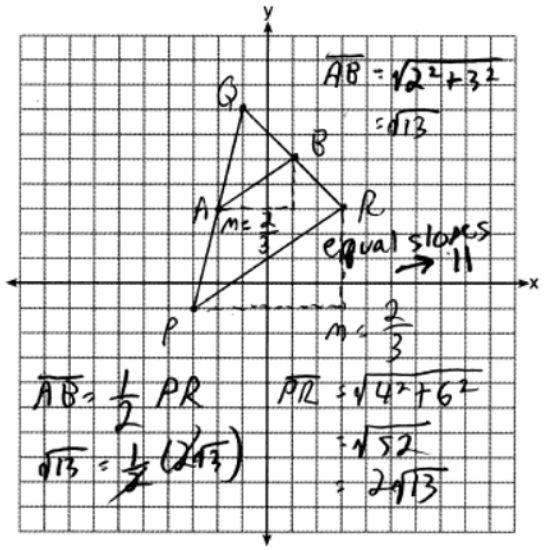
$B(6,-8) - (2,-3) = (4,-5) \rightarrow (5,4) + (2,-3) = B'(7,1)$

$C(2,-9) - (2,-3) = (0,-6) \rightarrow (6,0) + (2,-3) = C'(8,-3)$

$\triangle A'B'C'$ and reflections preserve distance.

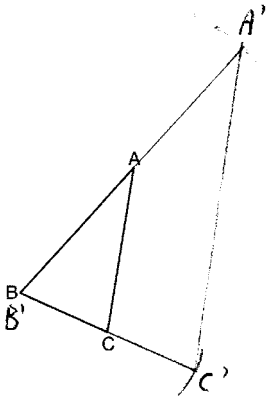
PTS: 4 REF: 081633geo TOP: Rotations KEY: grids

329 ANS:



PTS: 4 REF: 081732geo TOP: Triangles in the Coordinate Plane

330 ANS:



The length of $\overline{A'C'}$ is twice $\overline{AC}$.

PTS: 4 REF: 081632geo TOP: Constructions
KEY: congruent and similar figures

Geometry 6 Point Regents Exam Questions
Answer Section

331 ANS:

$\tan 52.8 = \frac{h}{x}$ $\quad h = x\tan 52.8$ $\quad \tan 34.9 = \frac{h}{x+8}$ $\quad h = (x+8)\tan 34.9$

$x\tan 52.8 = x\tan 34.9 + 8\tan 34.9$ $\quad x\tan 52.8 - x\tan 34.9 = 8\tan 34.9$ $\quad x(\tan 52.8 - \tan 34.9) = 8\tan 34.9$

$x = \frac{8\tan 34.9}{\tan 52.8 - \tan 34.9}$ $\quad x \approx 9$

$\tan 52.8 \approx \frac{h}{9}$ $\quad h \approx 11.86$ $\quad 11.86 + 1.7 \approx 13.6$

PTS: 6 REF: 011636geo TOP: Using Trigonometry to Find a Side
KEY: advanced

332 ANS:

C: $V = \pi(26.7)^2(750) - \pi(24.2)^2(750) = 95,437.5\pi$

$95,437.5\pi \text{ cm}^3\left(\frac{2.7\text{ g}}{\text{cm}^3}\right)\left(\frac{1\text{ kg}}{1000\text{ g}}\right)\left(\frac{\$0.38}{\text{kg}}\right) = \$307.62$

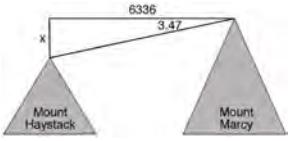
P: $V = 40^2(750) - 35^2(750) = 281,250$

$281,250 \text{ cm}^3\left(\frac{2.7\text{ g}}{\text{cm}^3}\right)\left(\frac{1\text{ kg}}{1000\text{ g}}\right)\left(\frac{\$0.38}{\text{kg}}\right) = \$288.56$

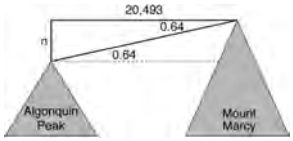
$\$307.62 - 288.56 = \$19.06$

PTS: 6 REF: 011736geo TOP: Density

333 ANS:



$\tan 3.47 = \frac{M}{6336}$ $\quad M \approx 384$ $\quad 4960 + 384 = 5344$

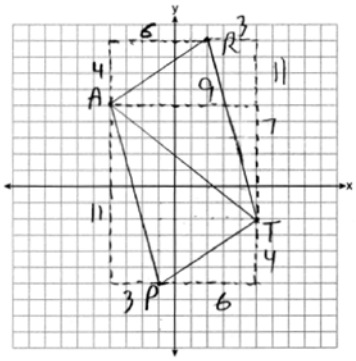


$\tan 0.64 = \frac{A}{20,493}$ $\quad A \approx 229$ $\quad 5344 - 229 = 5115$

PTS: 6 REF: fall1413geo TOP: Using Trigonometry to Find a Side
KEY: advanced

334 ANS:

$\triangle PAT$ is an isosceles triangle because sides $\overline{AP}$ and $\overline{AT}$ are congruent ($\sqrt{3^2+11^2} = \sqrt{7^2+9^2} = \sqrt{130}$). $R(2,9)$. Quadrilateral $PART$ is a parallelogram because the opposite sides are parallel since they have equal slopes



($m_{\overline{AR}} = \frac{4}{6} = \frac{2}{3}$; $m_{\overline{PT}} = \frac{4}{6} = \frac{2}{3}$; $m_{\overline{PA}} = -\frac{11}{3}$; $m_{\overline{RT}} = -\frac{11}{3}$)

PTS: 6 REF: 011835geo TOP: Quadrilaterals in the Coordinate Plane
KEY: grids

335 ANS:

$\tan 15 = \frac{6250}{x}$ $\tan 52 = \frac{6250}{y}$ $23325.3 - 4883 = 18442$ $\frac{18442 \text{ ft}}{1 \text{ min}}\left(\frac{1 \text{ mi}}{5280 \text{ ft}}\right)\left(\frac{60 \text{ min}}{1 \text{ h}}\right) \approx 210$

$x \approx 23325.3$ $y \approx 4883$

PTS: 6 REF: 061736geo TOP: Using Trigonometry to Find a Side
KEY: advanced

336 ANS:

Circle O, secant $\overline{ACD}$, tangent $\overline{AB}$ (Given). Chords $\overline{BC}$ and $\overline{BD}$ are drawn (Auxiliary lines). $\angle A \cong \angle A$, $\overset{\frown}{BC} \cong \overset{\frown}{BC}$ (Reflexive property). $\text{m}\angle BDC = \frac{1}{2}\text{m}\overset{\frown}{BC}$ (The measure of an inscribed angle is half the measure of the intercepted arc). $\text{m}\angle CBA = \frac{1}{2}\text{m}\overset{\frown}{BC}$ (The measure of an angle formed by a tangent and a chord is half the measure of the intercepted arc). $\angle BDC \cong \angle CBA$ (Angles equal to half of the same arc are congruent). $\triangle ABC \sim \triangle ADB$ (AA). $\frac{AB}{AC} = \frac{AD}{AB}$ (Corresponding sides of similar triangles are proportional). $AC \cdot AD = AB^2$ (In a proportion, the product of the means equals the product of the extremes).

PTS: 6 REF: spr1413geo TOP: Circle Proofs

337 ANS:

Isosceles trapezoid $ABCD$, $\angle CDE \cong \angle DCE$, $\overline{AE} \perp \overline{DE}$, and $\overline{BE} \perp \overline{CE}$ (given); $\overline{AD} \cong \overline{BC}$ (congruent legs of isosceles trapezoid); $\angle DEA$ and $\angle CEB$ are right angles (perpendicular lines form right angles); $\angle DEA \cong \angle CEB$ (all right angles are congruent); $\angle CDA \cong \angle DCB$ (base angles of an isosceles trapezoid are congruent); $\angle CDA - \angle CDE \cong \angle DCB - \angle DCE$ (subtraction postulate); $\triangle ADE \cong \triangle BCE$ (AAS); $\overline{EA} \cong \overline{EB}$ (CPCTC); $\angle EDA \cong \angle ECB$
$\triangle AEB$ is an isosceles triangle (an isosceles triangle has two congruent sides).

PTS: 6 REF: 081735geo TOP: Quadrilateral Proofs

338 ANS:

$\tan 16.5 = \frac{x}{13.5}$ $9 \times 16 \times 4.5 = 648$ $3752 - (35 \times 16 \times .5) = 3472$

$x \approx 4$ $13.5 \times 16 \times 4.5 = 972$ $3472 \times 7.48 \approx 25971$

$4 + 4.5 = 8.5$ $\frac{1}{2} \times 13.5 \times 16 \times 4 = 432$ $\frac{25971}{10.5} \approx 2473.4$

$12.5 \times 16 \times 8.5 = \underline{1700}$ $\frac{2473.4}{60} \approx 41$

3752

PTS: 6 REF: 081736geo TOP: Volume KEY: compositions

339 ANS:

Parallelogram *ABCD*, $\overline{BE} \perp \overline{CED}$, $\overline{DF} \perp \overline{BFC}$, $\overline{CE} \cong \overline{CF}$ (given). $\angle BEC \cong \angle DFC$ (perpendicular lines form right angles, which are congruent). $\angle FCD \cong \angle BCE$ (reflexive property). $\triangle BEC \cong \triangle DFC$ (ASA). $\overline{BC} \cong \overline{CD}$ (CPCTC). *ABCD* is a rhombus (a parallelogram with consecutive congruent sides is a rhombus).

PTS: 6 REF: 081535geo TOP: Quadrilateral Proofs

340 ANS:

Quadrilateral *ABCD* with diagonals $\overline{AC}$ and $\overline{BD}$ that bisect each other, and $\angle 1 \cong \angle 2$ (given); quadrilateral *ABCD* is a parallelogram (the diagonals of a parallelogram bisect each other); $\overline{AB} \parallel \overline{CD}$ (opposite sides of a parallelogram are parallel); $\angle 1 \cong \angle 3$ and $\angle 2 \cong \angle 4$ (alternate interior angles are congruent); $\angle 2 \cong \angle 3$ and $\angle 3 \cong \angle 4$ (substitution); $\triangle ACD$ is an isosceles triangle (the base angles of an isosceles triangle are congruent); $\overline{AD} \cong \overline{DC}$ (the sides of an isosceles triangle are congruent); quadrilateral *ABCD* is a rhombus (a rhombus has consecutive congruent sides); $\overline{AE} \perp \overline{BE}$ (the diagonals of a rhombus are perpendicular); $\angle BEA$ is a right angle (perpendicular lines form a right angle); $\triangle AEB$ is a right triangle (a right triangle has a right angle).

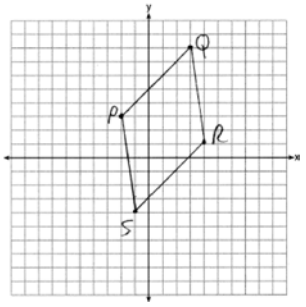
PTS: 6 REF: 061635geo TOP: Quadrilateral Proofs

341 ANS:

$\overline{PQ}$ $\sqrt{(8-3)^2 + (3--2)^2} = \sqrt{50}$ $\overline{QR}$ $\sqrt{(1-8)^2 + (4-3)^2} = \sqrt{50}$ $\overline{RS}$ $\sqrt{(-4-1)^2 + (-1-4)^2} = \sqrt{50}$

$\overline{PS}$ $\sqrt{(-4-3)^2 + (-1--2)^2} = \sqrt{50}$ *PQRS* is a rhombus because all sides are congruent. $m_{\overline{PQ}} = \frac{8-3}{3--2} = \frac{5}{5} = 1$

$m_{\overline{QR}} = \frac{1-8}{4-3} = -7$ Because the slopes of adjacent sides are not opposite reciprocals, they are not perpendicular and do not form a right angle. Therefore *PQRS* is not a square.



PTS: 6 REF: 061735geo TOP: Quadrilaterals in the Coordinate Plane
KEY: grids

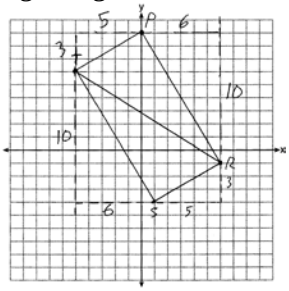
342 ANS:

Parallelogram *ANDR* with $\overline{AW}$ and $\overline{DE}$ bisecting $\overline{NWD}$ and $\overline{REA}$ at points *W* and *E* (Given). $\overline{AN} \cong \overline{RD}$, $\overline{AR} \cong \overline{DN}$ (Opposite sides of a parallelogram are congruent). $AE = \frac{1}{2}AR$, $WD = \frac{1}{2}DN$, so $\overline{AE} \cong \overline{WD}$ (Definition of bisect and division property of equality). $\overline{AR} \parallel \overline{DN}$ (Opposite sides of a parallelogram are parallel). *AWDE* is a parallelogram (Definition of parallelogram). $RE = \frac{1}{2}AR$, $NW = \frac{1}{2}DN$, so $\overline{RE} \cong \overline{NW}$ (Definition of bisect and division property of equality). $\overline{ED} \cong \overline{AW}$ (Opposite sides of a parallelogram are congruent). $\triangle ANW \cong \triangle DRE$ (SSS).

PTS: 6 REF: 011635geo TOP: Quadrilateral Proofs

343 ANS:

$m_{\overline{TS}} = \frac{-10}{6} = -\frac{5}{3}$ $m_{\overline{SR}} = \frac{3}{5}$ Since the slopes of $\overline{TS}$ and $\overline{SR}$ are opposite reciprocals, they are perpendicular and form a right angle. $\triangle RST$ is a right triangle because $\angle S$ is a right angle. $P(0,9)$ $m_{\overline{RP}} = \frac{-10}{6} = -\frac{5}{3}$ $m_{\overline{PT}} = \frac{3}{5}$ Since the slopes of all four adjacent sides ($\overline{TS}$ and $\overline{SR}$, $\overline{SR}$ and $\overline{RP}$, $\overline{PT}$ and $\overline{TS}$, $\overline{RP}$ and $\overline{PT}$) are opposite reciprocals, they are perpendicular and form right angles. Quadrilateral *RSTP* is a rectangle because it has four right angles.



PTS: 6 REF: 061536geo TOP: Quadrilaterals in the Coordinate Plane
KEY: grids

344 ANS:

$\tan 47 = \frac{x}{8.5}$ Cone: $V = \frac{1}{3}\pi(8.5)^2(9.115) \approx 689.6$ Cylinder: $V = \pi(8.5)^2(25) \approx 5674.5$ Hemisphere:

$x \approx 9.115$

$V = \frac{1}{2}\left(\frac{4}{3}\pi(8.5)^3\right) \approx 1286.3$ $689.6 + 5674.5 + 1286.3 \approx 7650$ No, because $7650 \cdot 62.4 = 477,360$

$477,360 \cdot .85 = 405,756$, which is greater than 400,000.

PTS: 6 REF: 061535geo TOP: Density

345 ANS:

$V = \frac{1}{3}\pi\left(\frac{3}{2}\right)^2 \cdot 8 \approx 18.85 \cdot 100 = 1885$ $1885 \cdot 0.52 \cdot 0.10 = 98.02$ $1.95(100) - (37.83 + 98.02) = 59.15$

PTS: 6 REF: 081536geo TOP: Density

346 ANS:

Circle O, chords $\overline{AB}$ and $\overline{CD}$ intersect at E (Given); Chords $\overline{CB}$ and $\overline{AD}$ are drawn (auxiliary lines drawn); $\angle CEB \cong \angle AED$ (vertical angles); $\angle C \cong \angle A$ (Inscribed angles that intercept the same arc are congruent); $\triangle BCE \sim \triangle DAE$ (AA); $\frac{AE}{CE} = \frac{ED}{EB}$ (Corresponding sides of similar triangles are proportional); $AE \cdot EB = CE \cdot ED$ (The product of the means equals the product of the extremes).

PTS: 6 REF: 081635geo TOP: Circle Proofs

347 ANS:

$V = \frac{1}{3}\pi\left(\frac{8.3}{2}\right)^2(10.2) + \frac{1}{2}\cdot\frac{4}{3}\pi\left(\frac{8.3}{2}\right)^3 \approx 183.961 + 149.693 \approx 333.65\,\text{cm}^3 \quad 333.65 \times 50 = 16682.7\,\text{cm}^3$

$16682.7 \times 0.697 = 11627.8\,\text{g} \quad 11.6278 \times 3.83 = \$44.53$

PTS: 6 REF: 081636geo TOP: Density

348 ANS:

It is given that point D is the image of point A after a reflection in line CH. It is given that $\overleftrightarrow{CH}$ is the perpendicular bisector of $\overline{BCE}$ at point C. Since a bisector divides a segment into two congruent segments at its midpoint, $\overline{BC} \cong \overline{EC}$. Point E is the image of point B after a reflection over the line CH, since points B and E are equidistant from point C and it is given that $\overleftrightarrow{CH}$ is perpendicular to $\overline{BE}$. Point C is on $\overleftrightarrow{CH}$, and therefore, point C maps to itself after the reflection over $\overleftrightarrow{CH}$. Since all three vertices of triangle ABC map to all three vertices of triangle DEC under the same line reflection, then $\triangle ABC \cong \triangle DEC$ because a line reflection is a rigid motion and triangles are congruent when one can be mapped onto the other using a sequence of rigid motions.

PTS: 6 REF: spr1414geo TOP: Triangle Congruency

349 ANS:

Similar triangles are required to model and solve a proportion. $\frac{x+5}{1.5} = \frac{x}{1}$ $\frac{1}{3}\pi(1.5)^2(15) - \frac{1}{3}\pi(1)^2(10) \approx 24.9$

$$x + 5 = 1.5x$$
$$5 = .5x$$
$$10 = x$$
$$10 + 5 = 15$$

PTS: 6 REF: 061636geo TOP: Volume KEY: cones

350 ANS:

Quadrilateral $ABCD$, $\overline{AB} \cong \overline{CD}$, $\overline{AB} \| \overline{CD}$, and $\overline{BF}$ and $\overline{DE}$ are perpendicular to diagonal $\overline{AC}$ at points F and E (given). $\angle AED$ and $\angle CFB$ are right angles (perpendicular lines form right angles). $\angle AED \cong \angle CFB$ (All right angles are congruent). $ABCD$ is a parallelogram (A quadrilateral with one pair of sides congruent and parallel is a parallelogram). $\overline{AD} \| \overline{BC}$ (Opposite sides of a parallelogram are parallel). $\angle DAE \cong \angle BCF$ (Parallel lines cut by a transversal form congruent alternate interior angles). $\overline{DA} \cong \overline{BC}$ (Opposite sides of a parallelogram are congruent). $\triangle ADE \cong \triangle CBF$ (AAS). $\overline{AE} \cong \overline{CF}$ (CPCTC).

PTS: 6 REF: 011735geo TOP: Quadrilateral Proofs