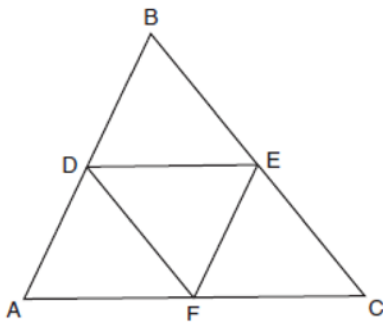


Geometry Common Core State Standards Regents Bimodal Worksheets

- 1 Which equation represents the line that passes through the point $(-2,2)$ and is parallel to

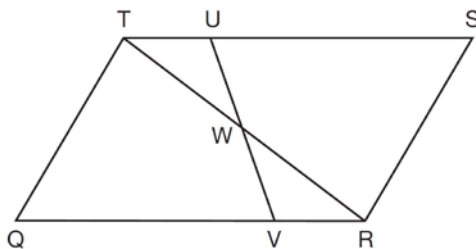
$$y = \frac{1}{2}x + 8?$$

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



The perimeter of quadrilateral $ADEF$ is equivalent to

- 3 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 .

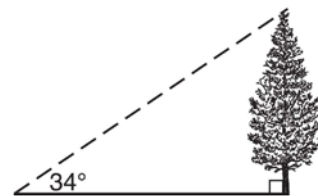


If $m\angle S = 60^\circ$, $m\angle SRT = 83^\circ$, and $m\angle TWU = 35^\circ$, what is $m\angle WVQ$?

- 4 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?

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

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

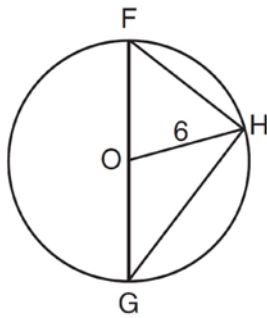


If the point is 20 feet from the base of the tree, what is the height of the tree, to the nearest tenth of a foot?

- 7 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

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

- 9 Triangle \overline{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 ?

- 10 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?

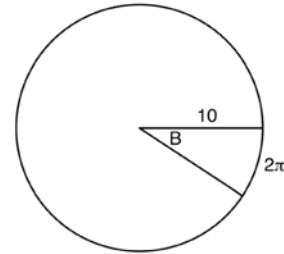
- 11 Seawater contains approximately 1.2 ounces of salt per liter on average. How many gallons of seawater, to the *nearest tenth of a gallon*, would contain 1 pound of salt?

- 12 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?

- 13 If $x^2 + 4x + y^2 - 6y - 12 = 0$ is the equation of a circle, the length of the radius is

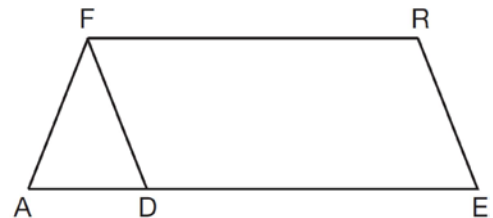
- 14 A hemispherical tank is filled with water and has a diameter of 10 feet. If water weighs 62.4 pounds per cubic foot, what is the total weight of the water in a full tank, to the *nearest pound*?

- 15 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?

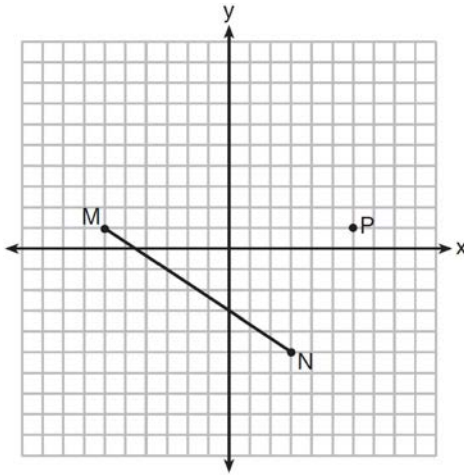
- 16 In the diagram of parallelogram $FRED$ shown below, \overline{ED} is extended to A , and \overline{AF} is drawn such that $\overline{AF} \cong \overline{DF}$.



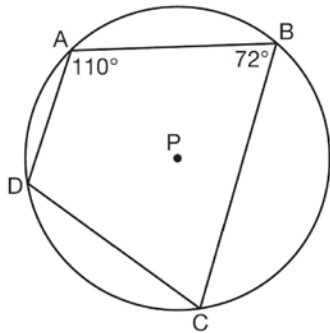
If $m\angle R = 124^\circ$, what is $m\angle AFD$?

- 17 If an equilateral triangle is continuously rotated around one of its medians, which 3-dimensional object is generated?

- 18 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} ?



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



What is $m\angle ADC$?

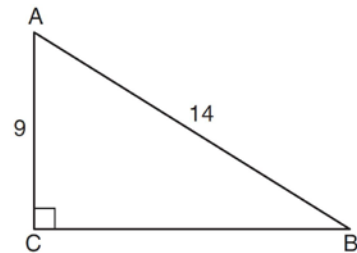
- 20 A quadrilateral has vertices with coordinates $(-3,1)$, $(0,3)$, $(5,2)$, and $(-1,-2)$. Which type of quadrilateral is this?

- 21 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?

- 22 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?

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

- 24 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?

- 25 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?

26 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*?

27 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?

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

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

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

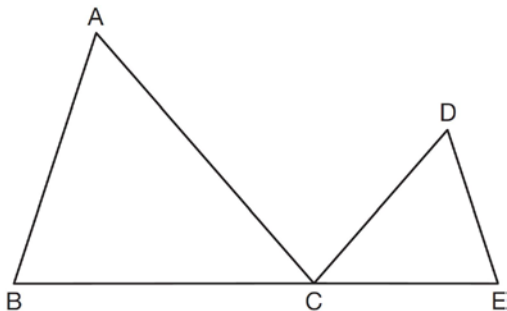
STEP 2 $x^2 + 4x + 4 = -y^2 + 20 - 4$

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

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

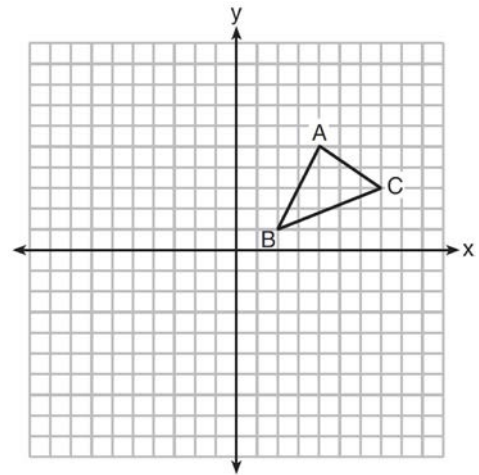
In which step did he make an error in his work?

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



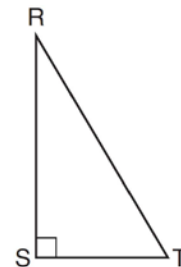
If $AC = 12$, $DC = 7$, $DE = 5$, and the perimeter of $\triangle ABC$ is 30, what is the perimeter of $\triangle DEC$?

30 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} ?

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

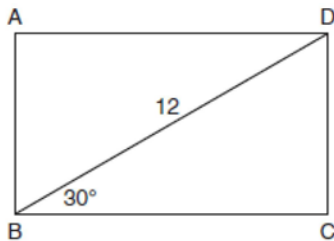


32 A hemispherical water tank has an inside diameter of 10 feet. If water has a density of 62.4 pounds per cubic foot, what is the weight of the water in a full tank, to the *nearest pound*?

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

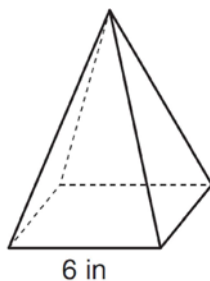


- 34 The diagram shows rectangle $ABCD$, with diagonal \overline{BD} .



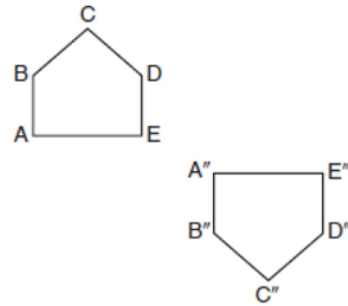
What is the perimeter of rectangle $ABCD$, to the nearest tenth?

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

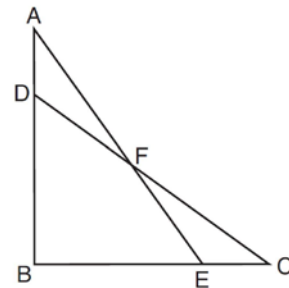


If the altitude of the pyramid measures 12 inches, its volume, in cubic inches, is

- 36 Identify which sequence of transformations could map pentagon $ABCDE$ onto pentagon $A''B''C''D''E''$, as shown below.



- 37 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?

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

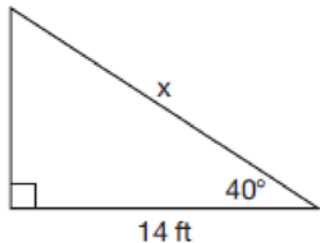
- 39 The endpoints of one side of a regular pentagon are $(-1, 4)$ and $(2, 3)$. What is the perimeter of the pentagon?

40 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° ?

41 Line segment \overline{NY} has endpoints $N(-11,5)$ and $Y(5,-7)$. What is the equation of the perpendicular bisector of \overline{NY} ?

42 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?

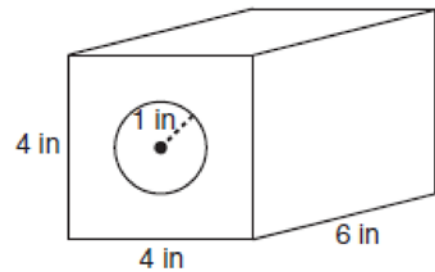
43 Given the right triangle in the diagram below, what is the value of x , to the nearest foot?



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

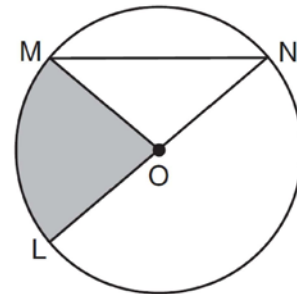
45 Point P is on the directed line segment from point $X(-6,-2)$ to point $Y(6,7)$ and divides the segment in the ratio 1:5. What are the coordinates of point P ?

46 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.



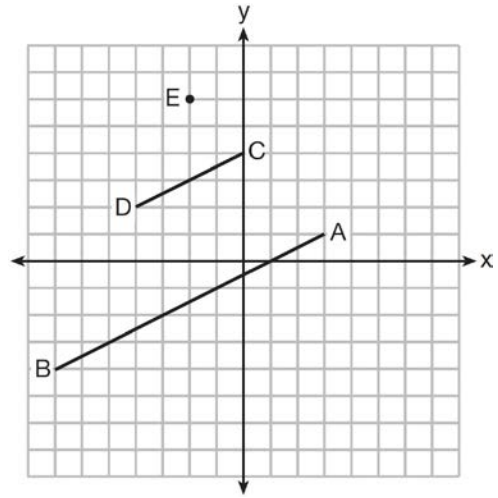
What is the approximate volume of the remaining solid, in cubic inches?

47 In the diagram below of circle O , the area of the shaded sector LOM is $2\pi \text{ cm}^2$.



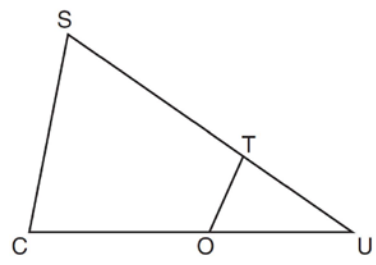
If the length of \overline{NL} is 6 cm, what is $m\angle N$?

- 48 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?

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

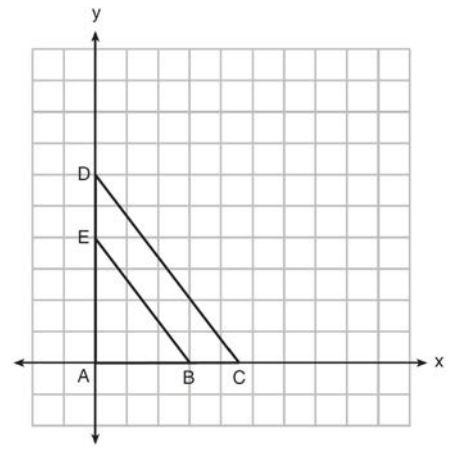


If $TU = 4$, $OU = 5$, and $OC = 7$, what is the length of \overline{ST} ?

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

- 51 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?

- 52 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

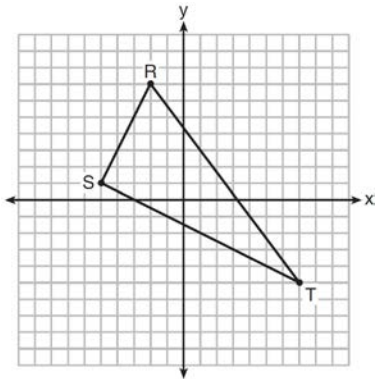
- 53 An equation of a line perpendicular to the line represented by the equation $y = -\frac{1}{2}x - 5$ and passing through $(6, -4)$ is

- 54 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?

55 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?

58 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?

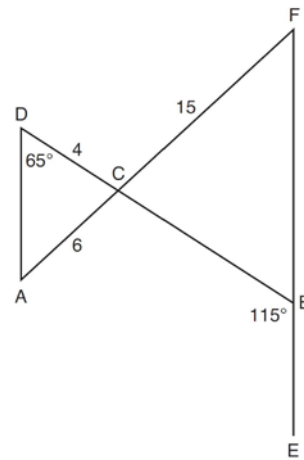
56 Triangle RST is graphed on the set of axes below.



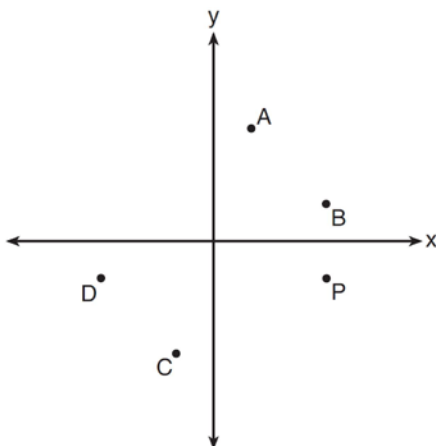
How many square units are in the area of $\triangle RST$?

59 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?

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



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

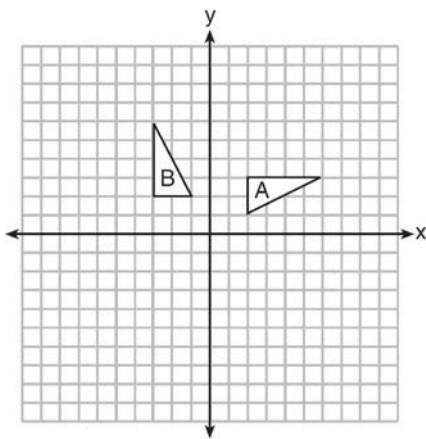


If $AC = 6$, $DC = 4$, $FC = 15$, $m\angle D = 65^\circ$, and $m\angle CBE = 115^\circ$, what is the length of \overline{CB} ?

61 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

62 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

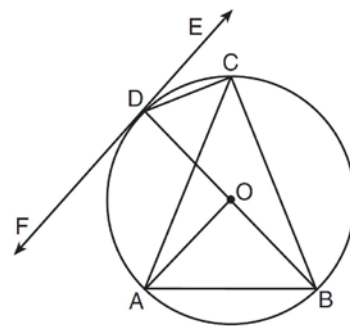
63 In the diagram below, which single transformation was used to map triangle A onto triangle B ?



64 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 \overline{EM} ?

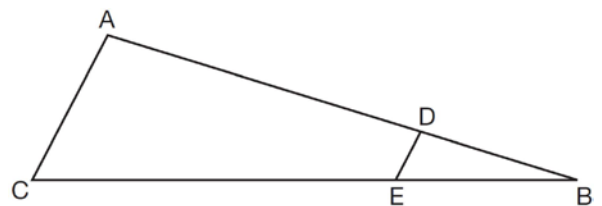
65 The cross section of a regular pyramid contains the altitude of the pyramid. The shape of this cross section is a

66 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."



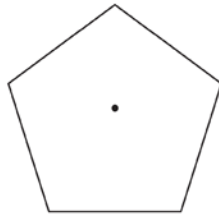
Which angle is Sam referring to?

67 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} ?

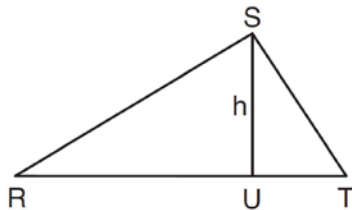
- 68 A regular pentagon is shown in the diagram below.



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

- 69 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?

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

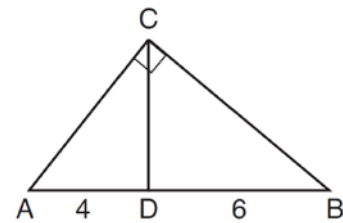


If $SU = h$, $UT = 12$, and $RT = 42$, which value of h will make $\triangle RST$ a right triangle with $\angle RST$ as a right angle?

- 71 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

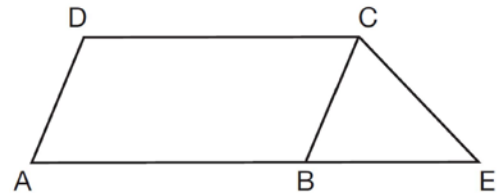
- 72 A plane intersects a hexagonal prism. The plane is perpendicular to the base of the prism. Which two-dimensional figure is the cross section of the plane intersecting the prism?

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



If $\overline{AD} \cong 4$ and $DB = 6$, which length of \overline{AC} makes $CD \perp AB$?

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

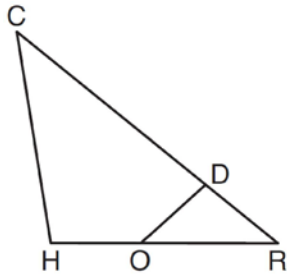


If $\overline{CE} \cong \overline{BE}$ and $m\angle D = 112^\circ$, what is $m\angle E$?

- 75 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} ?

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

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



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

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

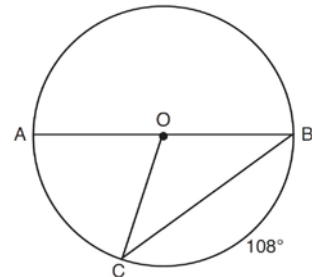
- 79 The Great Pyramid of Giza was constructed as a regular pyramid with a square base. It was built with an approximate volume of 2,592,276 cubic meters and a height of 146.5 meters. What was the length of one side of its base, to the *nearest meter*?

- 80 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?

- 81 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?

- 82 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 ?

- 83 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 $\frac{3}{10} \cdot \pi \cdot \left(\frac{1}{2} AB\right)^2$

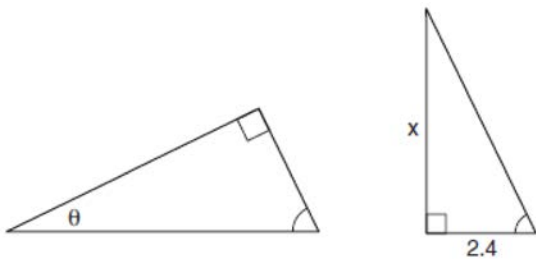
Dex $\frac{108}{360} \cdot \pi \cdot \frac{1}{2} (AB)^2$

Which students wrote correct formulas?

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

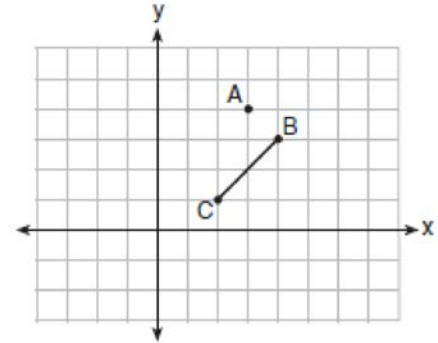
- 87 What are the coordinates of the point on the directed line segment from $K(-5,-4)$ to $L(5,1)$ that partitions the segment into a ratio of 3 to 2?

- 85 The diagram below shows two similar triangles.



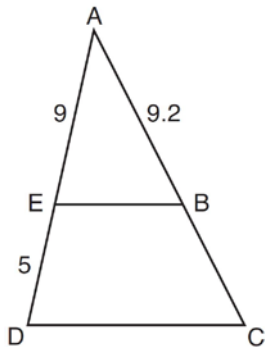
If $\tan \theta = \frac{3}{7}$, what is the value of x , to the nearest tenth?

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



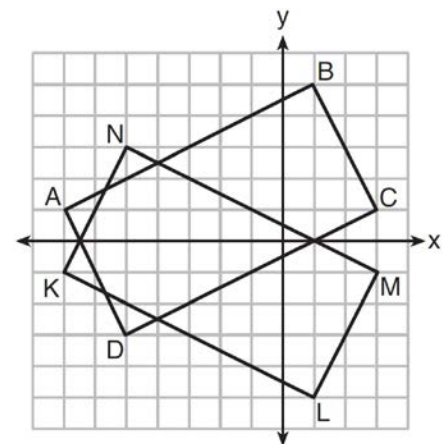
What are the coordinates of B' and C' after \overline{BC} undergoes a dilation centered at point A with a scale factor of 2?

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

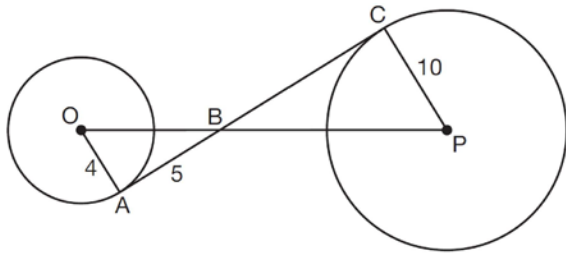


What is the length of \overline{AC} , to the nearest tenth?

- 89 On the set of axes below, rectangle $ABCD$ can be proven congruent to rectangle $KLMN$ using which transformation?

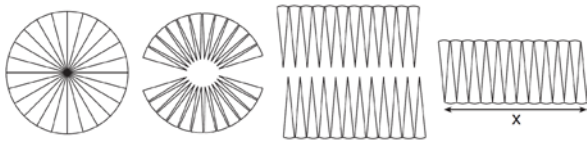


- 90 In the diagram shown below, \overline{AC} is tangent to circle O at A and to circle P at C , \overline{OP} intersects \overline{AC} at B , $OA = 4$, $AB = 5$, and $PC = 10$.



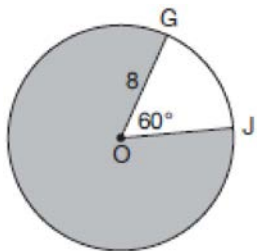
What is the length of \overline{BC} ?

- 91 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

- 92 In the diagram below of circle O , $GO = 8$ and $m\angle GOJ = 60^\circ$.



What is the area, in terms of π , of the shaded region?

Geometry Common Core State Standards Regents Bimodal Worksheets Answer Section

1 ANS:

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

$$y = mx + b$$

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

$$3 = b$$

PTS: 2 REF: 011701geo TOP: Parallel and Perpendicular Lines

KEY: write equation of parallel line

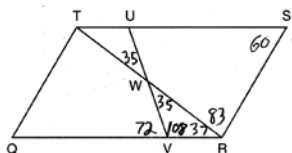
2 ANS:

$$AB + AC$$

PTS: 2 REF: 011704geo TOP: Midsegments

3 ANS:

72°



PTS: 2 REF: 011603geo TOP: Parallelograms

4 ANS:

15

$$\frac{1000}{20\pi} \approx 15.9$$

PTS: 2 REF: 011623geo TOP: Circumference

5 ANS:

20

$$\frac{1}{2} = \frac{x+3}{3x-1} \quad GR = 3(7) - 1 = 20$$

$$3x - 1 = 2x + 6$$

$$x = 7$$

PTS: 2 REF: 011620geo TOP: Similarity KEY: basic

6 ANS:

13.5

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

$$T \approx 13.5$$

PTS: 2

REF: 061505geo

TOP: Using Trigonometry to Find a Side

KEY: graphics

7 ANS:

22

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

$$8x + 64 = 6x + 108$$

$$2x = 44$$

$$x = 22$$

PTS: 2

REF: 011715geo

TOP: Chords, Secants and Tangents

KEY: secants drawn from common point, length

8 ANS:

dilation

PTS: 2

REF: 081602geo

TOP: Identifying Transformations

KEY: basic

9 ANS:

 6π

$$\frac{60}{360} \cdot 6^2 \pi = 6\pi$$

PTS: 2

REF: 081518geo

TOP: Sectors

10 ANS:

2

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

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

PTS: 2

REF: 061519geo

TOP: Surface Area

11 ANS:

3.5

$$\frac{11}{1.2 \text{ oz}} \left(\frac{16 \text{ oz}}{1 \text{ lb}} \right) = \frac{13.\bar{3}1}{\text{lb}} \frac{13.\bar{3}1}{\text{lb}} \left(\frac{1 \text{ g}}{3.7851} \right) \approx \frac{3.5 \text{ g}}{1 \text{ lb}}$$

PTS: 2

REF: 061618geo

TOP: Density

12 ANS:

18.8

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

$$x \approx 18.8$$

PTS: 2 REF: 061611geo TOP: Using Trigonometry to Find a Side

KEY: without graphics

13 ANS:

5

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

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

PTS: 2 REF: 081509geo TOP: Equations of Circles

14 ANS:

16,336

$$V = \frac{\frac{4}{3} \pi \left(\frac{10}{2} \right)^3}{2} \approx 261.8 \cdot 62.4 = 16,336$$

PTS: 2 REF: 081516geo TOP: Density

15 ANS:

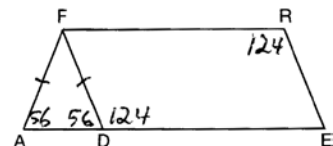
$$\frac{\pi}{5}$$

$$\theta = \frac{s}{r} = \frac{2\pi}{10} = \frac{\pi}{5}$$

PTS: 2 REF: fall1404geo TOP: Arc Length KEY: angle

16 ANS:

68°



PTS: 2 REF: 081508geo TOP: Parallelograms

17 ANS:

cone

PTS: 2 REF: 081603geo TOP: Rotations of Two-Dimensional Objects

18 ANS:

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

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

$$1 = -4 + b$$

$$5 = b$$

PTS: 2 REF: 081510geo TOP: Parallel and Perpendicular Lines

KEY: write equation of parallel line

19 ANS:

108°

PTS: 2 REF: 081515geo TOP: Inscribed Quadrilaterals

20 ANS:

trapezoid

$$\frac{-2-1}{-1-3} = \frac{-3}{2} \quad \frac{3-2}{0-5} = \frac{1}{-5} \quad \frac{3-1}{0-3} = \frac{2}{3} \quad \frac{2-2}{5-1} = \frac{4}{6} = \frac{2}{3}$$

PTS: 2 REF: 081522geo TOP: Quadrilaterals in the Coordinate Plane

KEY: general

21 ANS:

$$y = 2x - 6$$

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

22 ANS:

18 inches

$$3 \times 6 = 18$$

PTS: 2 REF: 061602geo TOP: Line Dilations

23 ANS:

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

$$x^2 - 4x + 4 + y^2 + 8y + 16 = -11 + 4 + 16$$

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

PTS: 2 REF: 081616geo TOP: Equations of Circles

24 ANS:

50

$$\cos A = \frac{9}{14}$$

$$A \approx 50^\circ$$

PTS: 2 REF: 011616geo TOP: Using Trigonometry to Find an Angle

25 ANS:

1.2

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

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

26 ANS:

20

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

PTS: 2 REF: 011619geo TOP: Density

27 ANS:

center $(0, -3)$ and radius 4

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

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

PTS: 2 REF: 061514geo TOP: Equations of Circles

28 ANS:

Step 2

PTS: 2 REF: 061603geo TOP: Equations of Circles

29 ANS:

17.5

$$\frac{7}{12} \cdot 30 = 17.5$$

PTS: 2 REF: 061521geo TOP: Similarity KEY: perimeter and area

30 ANS:

 $-\frac{5}{2}$

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

- 31 ANS:
a cone
- PTS: 2 REF: 061501geo TOP: Rotations of Two-Dimensional Objects
- 32 ANS:
16,336
 $\frac{1}{2} \left(\frac{4}{3} \right) \pi \cdot 5^3 \cdot 62.4 \approx 16,336$
- PTS: 2 REF: 061620geo TOP: Density
- 33 ANS:
cylinder
- PTS: 2 REF: 081503geo TOP: Rotations of Two-Dimensional Objects
- 34 ANS:
32.8
 $6 + 6\sqrt{3} + 6 + 6\sqrt{3} \approx 32.8$
- PTS: 2 REF: 011709geo TOP: 30-60-90 Triangles
- 35 ANS:
144
 $V = \frac{1}{3} \cdot 6^2 \cdot 12 = 144$
- PTS: 2 REF: 011607geo TOP: Volume KEY: pyramids
- 36 ANS:
line reflection followed by a translation
- PTS: 2 REF: 011710geo TOP: Mapping a Polygon onto Itself
- 37 ANS:
 $\overline{AD} \cong \overline{CE}$
- PTS: 2 REF: 081622geo TOP: Triangle Congruency
- 38 ANS:
10
 $r = \sqrt{(7-3)^2 + (1-(-2))^2} = \sqrt{16+9} = 5$
- PTS: 2 REF: 061503geo TOP: Circles in the Coordinate Plane
- 39 ANS:
 $5\sqrt{10}$
 $\sqrt{(-1-2)^2 + (4-3)^2} = \sqrt{10}$
- PTS: 2 REF: 011615geo TOP: Polygons in the Coordinate Plane

40 ANS:

$$\frac{32\pi}{3}$$

$$\frac{60}{360} \cdot 8^2 \pi = \frac{1}{6} \cdot 64\pi = \frac{32\pi}{3}$$

PTS: 2 REF: 061624geo TOP: Sectors

41 ANS:

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

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

PTS: 2 REF: 061612geo TOP: Parallel and Perpendicular Lines

KEY: perpendicular bisector

42 ANS:

55

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

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

43 ANS:

18

$$\cos 40 = \frac{14}{x}$$

$$x \approx 18$$

PTS: 2 REF: 011712geo TOP: Using Trigonometry to Find a Side

44 ANS:

(-3, 2) and 6

$$x^2 + 6x + 9 + y^2 - 4y + 4 = 23 + 9 + 4$$

$$(x + 3)^2 + (y - 2)^2 = 36$$

PTS: 2 REF: 011617geo TOP: Equations of Circles

45 ANS:

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

$$x = -6 + \frac{1}{6}(6 - -6) = -6 + 2 = -4 \quad y = -2 + \frac{1}{6}(7 - -2) = -2 + \frac{9}{6} = -\frac{1}{2}$$

PTS: 2 REF: 081618geo TOP: Directed Line Segments

46 ANS:

77

$$4 \times 4 \times 6 - \pi(1)^2(6) \approx 77$$

PTS: 2

REF: 011711geo

TOP: Volume

KEY: compositions

47 ANS:

40°

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

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

PTS: 2

REF: 011612geo

TOP: Sectors

48 ANS:

$$\frac{EC}{EA}$$

PTS: 2

REF: 061518geo

TOP: Line Dilations

49 ANS:

11

$$\frac{12}{4} = \frac{x}{5} \quad 15 - 4 = 11$$

$$x = 15$$

PTS: 2

REF: 011624geo

TOP: Similarity

KEY: basic

50 ANS:

octagon

$$\frac{360^\circ}{45^\circ} = 8$$

PTS: 2

REF: 061510geo

TOP: Mapping a Polygon onto Itself

51 ANS:

center (0,3) and radius = $2\sqrt{2}$

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

$$x^2 + (y - 3)^2 = 8$$

PTS: 2

REF: 011718geo

TOP: Equations of Circles

52 ANS:

$$\frac{2}{3}$$

$$\frac{4}{6} = \frac{3}{4.5} = \frac{2}{3}$$

PTS: 2

REF: 081523geo

TOP: Dilations

53 ANS:

$$y = 2x - 16$$

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

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

$$-16 = b$$

PTS: 2 REF: 011602geo TOP: Parallel and Perpendicular Lines

KEY: write equation of perpendicular line

54 ANS:

34.1

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

55 ANS:

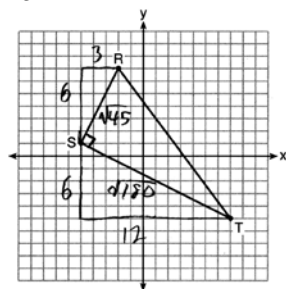
945

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

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

56 ANS:

45



$$\sqrt{45} = 3\sqrt{5} \quad a = \frac{1}{2} (3\sqrt{5})(6\sqrt{5}) = \frac{1}{2} (18)(5) = 45$$

$$\sqrt{180} = 6\sqrt{5}$$

PTS: 2 REF: 061622geo TOP: Polygons in the Coordinate Plane

57 ANS:

A

PTS: 2 REF: 081605geo TOP: Rotations KEY: grids

58 ANS:
102
 $V = 12 \cdot 8.5 \cdot 4 = 408$
 $W = 408 \cdot 0.25 = 102$

PTS: 2 REF: 061507geo TOP: Density

59 ANS:
9694
 $C = \pi d \quad V = \pi \left(\frac{2.25}{\pi} \right)^2 \cdot 8 \approx 12.8916 \quad W = 12.8916 \cdot 752 \approx 9694$
 $4.5 = \pi d$
 $\frac{4.5}{\pi} = d$
 $\frac{2.25}{\pi} = r$

PTS: 2 REF: 081617geo TOP: Density

60 ANS:
10
 $\frac{f}{4} = \frac{15}{6}$
 $f = 10$

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

61 ANS:
 $y = 3x - 1$
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

62 ANS:
4.9
 $s^2 + s^2 = 7^2$
 $2s^2 = 49$
 $s^2 = 24.5$
 $s \approx 4.9$

PTS: 2 REF: 081511geo TOP: Pythagorean Theorem

63 ANS:
rotation

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

64 ANS:

$$y = x - 1$$

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

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

$$-1 = b$$

PTS: 2

REF: 081614geo

TOP: Quadrilaterals in the Coordinate Plane

KEY: general

65 ANS:

triangle

PTS: 2

REF: 081613geo

TOP: Cross-Sections of Three-Dimensional Objects

66 ANS:

 $\angle DCB$

PTS: 2

REF: 011621geo

TOP: Chords, Secants and Tangents

KEY: inscribed

67 ANS:

12

$$\frac{12}{4} = \frac{36}{x}$$

$$12x = 144$$

$$x = 12$$

PTS: 2

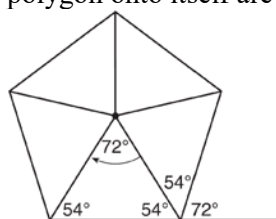
REF: 061621geo

TOP: Side Splitter Theorem

68 ANS:

 72°

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.



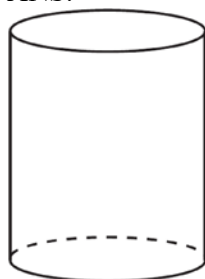
$$\frac{360}{5} = 72.$$

PTS: 2

REF: spr1402geo

TOP: Mapping a Polygon onto Itself

69 ANS:



PTS: 2

REF: 061601geo TOP: Rotations of Two-Dimensional Objects

70 ANS:

$$6\sqrt{10}$$

$$h^2 = 30 \cdot 12$$

$$h^2 = 360$$

$$h = 6\sqrt{10}$$

PTS: 2

REF: 061613geo TOP: Similarity KEY: altitude

71 ANS:

(5,1)

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

1

PTS: 2

REF: 011720geo TOP: Directed Line Segments

72 ANS:

rectangle

PTS: 2

REF: 011723geo TOP: Cross-Sections of Three-Dimensional Objects

73 ANS:

$$2\sqrt{10}$$

$$x^2 = 4 \cdot 10$$

$$x = \sqrt{40}$$

$$x = 2\sqrt{10}$$

PTS: 2

REF: 081610geo TOP: Similarity KEY: leg

74 ANS:

44°

$$180 - (68 \cdot 2)$$

PTS: 2

REF: 081624geo TOP: Parallelograms

75 ANS:

40

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

PTS: 2 REF: 081621geo TOP: Line Dilations

76 ANS:

17.3

$$\sqrt{20^2 - 10^2} \approx 17.3$$

PTS: 2 REF: 081608geo TOP: Pythagorean Theorem

KEY: without graphics

77 ANS:

11

$$\frac{x}{10} = \frac{6}{4} \quad \overline{CD} = 15 - 4 = 11$$

$$x = 15$$

PTS: 2 REF: 081612geo TOP: Similarity KEY: basic

78 ANS:

$$\frac{\sqrt{21}}{5}$$

PTS: 2 REF: 081606geo TOP: Cofunctions

79 ANS:

230

$$2592276 = \frac{1}{3} \cdot s^2 \cdot 146.5$$

$$230 \approx s$$

PTS: 2 REF: 081521geo TOP: Volume KEY: pyramids

80 ANS:

25

$$14 \times 16 \times 10 = 2240 \quad \frac{2240 - 1680}{2240} = 0.25$$

PTS: 2 REF: 011604geo TOP: Volume KEY: prisms

81 ANS:

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

PTS: 2 REF: 061606geo TOP: Volume KEY: compositions

82 ANS:

$$y = -2x + 4$$

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

83 ANS:

Beth and Carl

PTS: 2 REF: 081619geo TOP: Sectors

84 ANS:

right

$$m_{RT} = \frac{5 - -3}{4 - -2} = \frac{8}{6} = \frac{4}{3} \quad m_{ST} = \frac{5 - 2}{4 - 8} = \frac{3}{-4} = -\frac{3}{4} \quad \text{Slopes are opposite reciprocals, so lines form a right angle.}$$

PTS: 2 REF: 011618geo TOP: Triangles in the Coordinate Plane

85 ANS:

5.6

$$\tan \theta = \frac{2.4}{x}$$

$$\frac{3}{7} = \frac{2.4}{x}$$

$$x = 5.6$$

PTS: 2 REF: 011707geo TOP: Using Trigonometry to Find a Side

86 ANS:

14.3

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

$$9x = 46$$

$$x \approx 5.1$$

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

87 ANS:

 $(1, -1)$

$$-5 + \frac{3}{5}(5 - -5) \quad -4 + \frac{3}{5}(1 - -4)$$

$$-5 + \frac{3}{5}(10) \quad -4 + \frac{3}{5}(5)$$

$$-5 + 6 \quad -4 + 3$$

$$1 \quad -1$$

PTS: 2 REF: spr1401geo TOP: Directed Line Segments

88 ANS:

 $B'(5, 2)$ and $C'(1, -2)$ $B: (4 - 3, 3 - 4) \rightarrow (1, -1) \rightarrow (2, -2) \rightarrow (2 + 3, -2 + 4)$ $C: (2 - 3, 1 - 4) \rightarrow (-1, -3) \rightarrow (-2, -6) \rightarrow (-2 + 3, -6 + 4)$

PTS: 2 REF: 011713geo TOP: Line Dilations

89 ANS:

reflection over the x -axis

PTS: 2 REF: 061616geo TOP: Identifying Transformations

KEY: graphics

90 ANS:

12.5

$$5 \cdot \frac{10}{4} = \frac{50}{4} = 12.5$$

PTS: 2 REF: 081512geo TOP: Chords, Secants and Tangents

KEY: common tangents

91 ANS:

16

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

PTS: 2 REF: 061523geo TOP: Circumference

92 ANS:

$$\frac{160\pi}{3}$$

$$\frac{300}{360} \cdot 8^2 \pi = \frac{160\pi}{3}$$

PTS: 2 REF: 011721geo TOP: Sectors