Geometry Regents Bimodal Worksheet # 1 Name: _____
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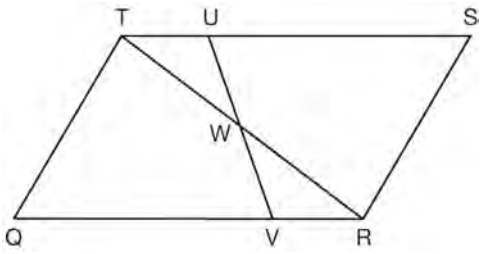
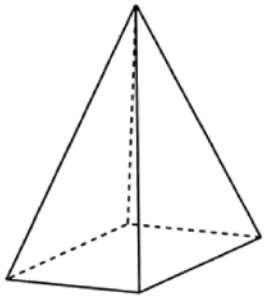
Geometry Regents Bimodal Worksheets

1 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 $m\angle WVQ$?

2 In the diagram below, a plane intersects a square pyramid parallel to its base.



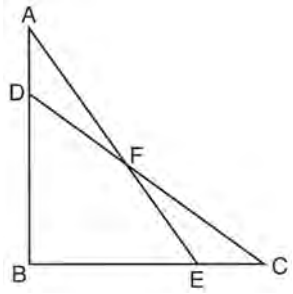
Which two-dimensional shape describes this cross section?

3 What is an equation of a circle whose center is $(1,4)$ and diameter is 10?

4 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*?

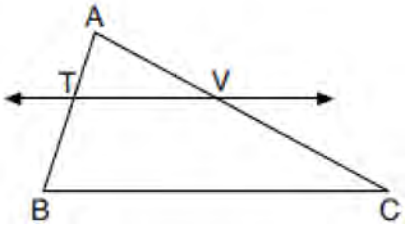
5 Seawater contains approximately 1.2 ounces of salt per liter on average. How many gallons of seawater, to the *nearest tenth of a gallon*, would contain 1 pound of salt?

6 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 ≅ SAS?

7 In the diagram below of $\triangle ABC$, $\overline{TV}$ intersects $\overline{AB}$ and $\overline{AC}$ at points *T* and *V* respectively, and $m\angle ATV = m\angle ABC$.



If $AT = 4$, $BC = 18$, $TB = 5$, and $AV = 6$, what is the perimeter of quadrilateral *TBCV*?

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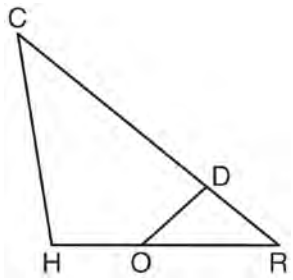
8 The table below shows the population and land area, in square miles, of four counties in New York State at the turn of the century.

County	**2000 Census Population**	**2000 Land Area** $\left(\text{mi}^2\right)$
Broome	200,536	706.82
Dutchess	280,150	801.59
Niagara	219,846	522.95
Saratoga	200,635	811.84

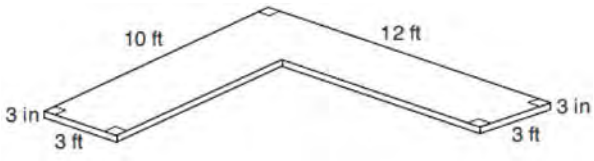
Which county had the greatest population density?

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



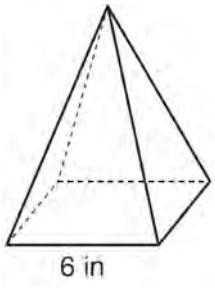
If $RD = 4$, $RO = 6$, and $OH = 4$, what is the length of $\overline{CD}$?

10 The diagram below models a countertop designed for a kitchen. The countertop is made of solid oak and is 3 inches thick.



If oak weighs approximately 44 pounds per cubic foot, the approximate weight, in pounds, of the countertop is

11 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

12 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*?

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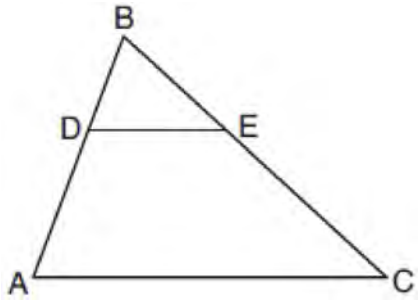
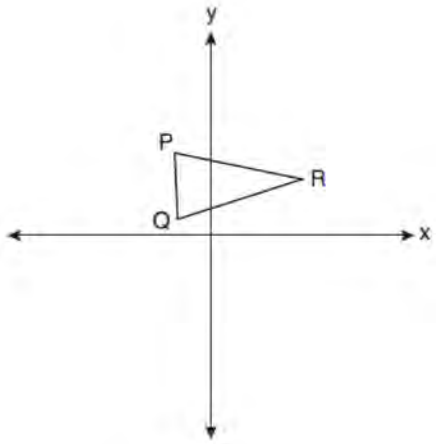
13 In the diagram below of $\triangle ABC$, D is a point on $\overline{BA}$, E is a point on $\overline{BC}$, and $\overline{DE}$ is drawn.



If $BD = 5$, $DA = 12$, and $BE = 7$, what is the length of $\overline{BC}$ so that $\overline{AC} \parallel \overline{DE}$?

14 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?

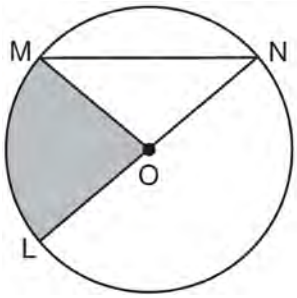
15 Triangle PQR is shown on the set of axes below.



Which quadrant will contain point R'', the image of point R, after a 90° clockwise rotation centered at $(0,0)$ followed by a reflection over the x-axis?

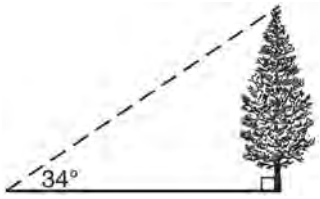
16 What are the coordinates of the center and the length of the radius of the circle whose equation is $x^2 + y^2 - 12y - 20.25 = 0$?

17 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$\angle N$?

18 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*?

19 A 12-foot ladder leans against a building and reaches a window 10 feet above ground. What is the measure of the angle, to the *nearest degree*, that the ladder forms with the ground?

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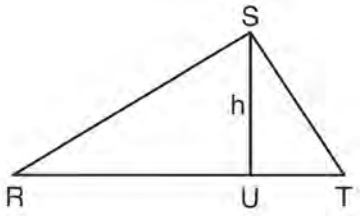
20 If $x^2 + 4x + y^2 - 6y - 12 = 0$ is the equation of a circle, the length of the radius is

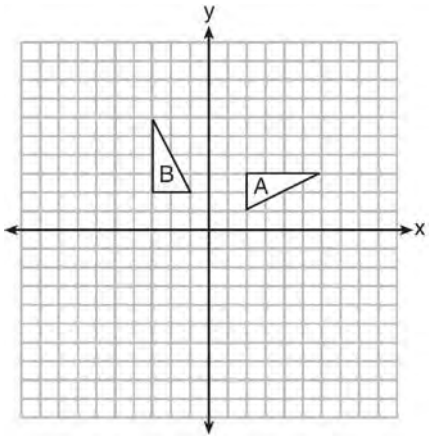
21 A 15-foot ladder leans against a wall and makes an angle of 65° with the ground. What is the horizontal distance from the wall to the base of the ladder, to the *nearest tenth of a foot*?

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

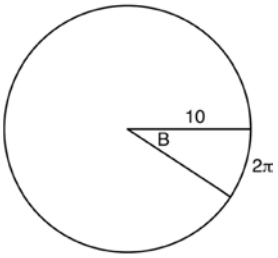


If $SU = h$, $UT = 12$, and $RT = 42$, which value of h will make $\triangle RST$ a right triangle with $\angle RST$ as a right angle?

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



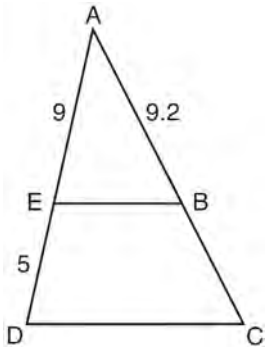
24 In the diagram below, the circle shown has radius 10. Angle B intercepts an arc with a length of 2π.



What is the measure of angle B, in radians?

25 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*?

26 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*?

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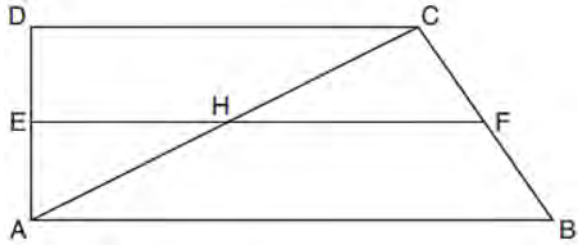
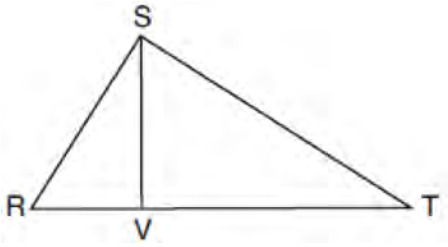
27 In quadrilateral $ABCD$ below, $\overline{AB} \parallel \overline{CD}$, and E, H, and F are the midpoints of $\overline{AD}$, $\overline{AC}$, and $\overline{BC}$, respectively.



If $AB = 24$, $CD = 18$, and $AH = 10$, then FH is

28 The coordinates of the endpoints of $\overline{QS}$ are $Q(-9,8)$ and $S(9,-4)$. Point R is on $\overline{QS}$ such that $QR{:}RS$ is in the ratio of 1:2. What are the coordinates of point R?

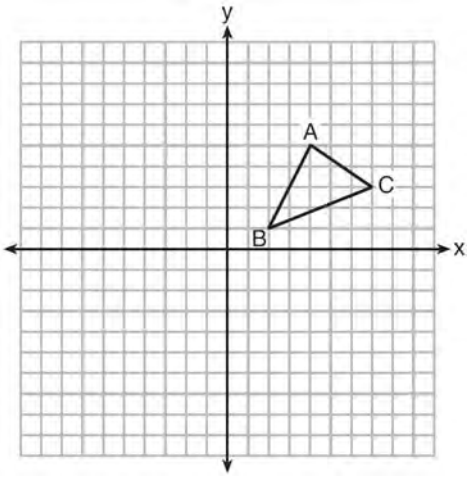
29 In right triangle RST below, altitude $\overline{SV}$ is drawn to hypotenuse $\overline{RT}$.



If $RV = 4.1$ and $TV = 10.2$, what is the length of $\overline{ST}$, to the *nearest tenth*?

30 In right triangle ABC, $m\angle C = 90°$ and $AC \neq BC$. Which trigonometric ratio is equivalent to $\sin B$?

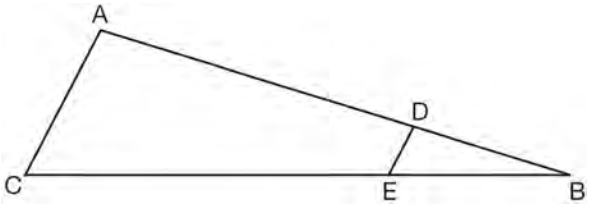
31 In the diagram below, $\triangle ABC$ has vertices $A(4,5)$, $B(2,1)$, and $C(7,3)$.



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

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

33 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 $\overline{AC}$?

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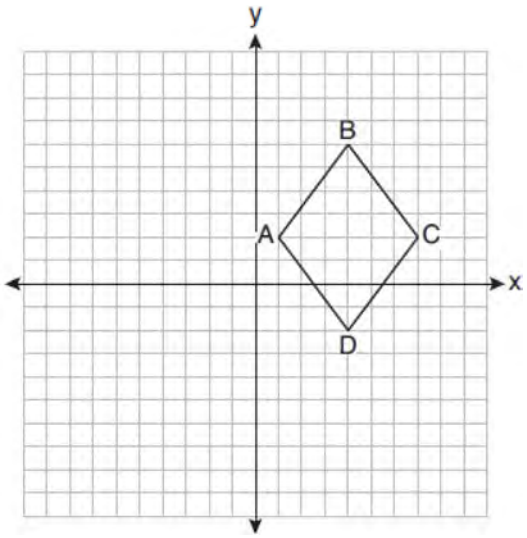
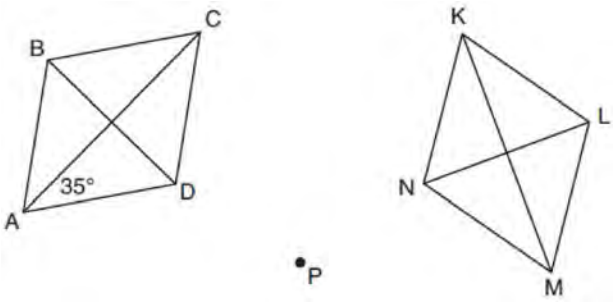
34 On the set of axes below, rhombus *ABCD* has vertices whose coordinates are $A(1,2)$, $B(4,6)$, $C(7,2)$, and $D(4,-2)$.



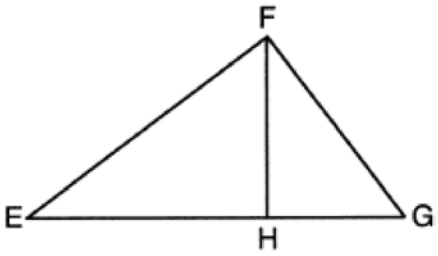
What is the area of rhombus *ABCD*?

35 Rhombus *ABCD* can be mapped onto rhombus *KLMN* by a rotation about point *P*, as shown below.



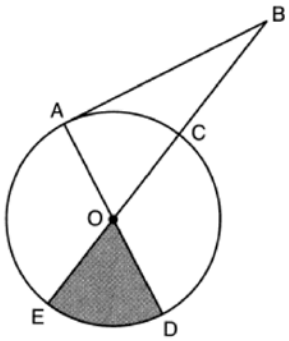
What is the measure of $\angle KNM$ if the measure of $\angle CAD = 35$?

36 In the diagram below of right triangle *EFG*, altitude $\overline{FH}$ intersects hypotenuse $\overline{EG}$ at *H*.



If $FH = 9$ and $EF = 15$, what is *EG*?

37 In the diagram below of circle *O*, tangent $\overline{AB}$ is drawn from external point *B*, and secant $\overline{BCOE}$ and diameter $\overline{AOD}$ are drawn.



If $m\angle OBA = 36°$ and $OC = 10$, what is the area of shaded sector *DOE*?

38 The coordinates of the endpoints of $\overline{SC}$ are $S(-7,3)$ and $C(2,-6)$. If point *M* is on $\overline{SC}$, what are the coordinates of *M* such that *SM*:*MC* is 1:2?

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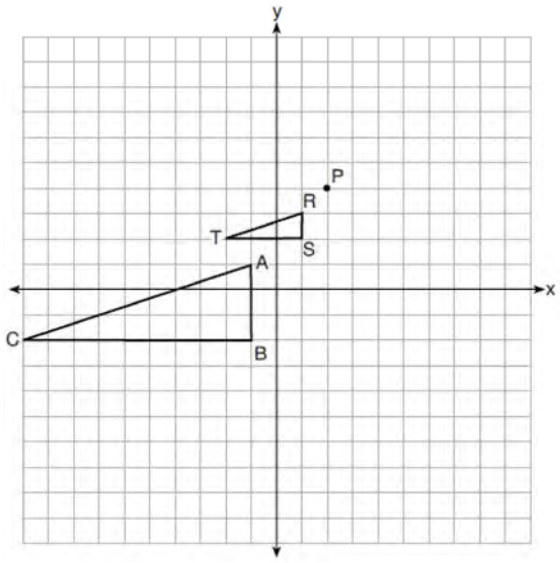
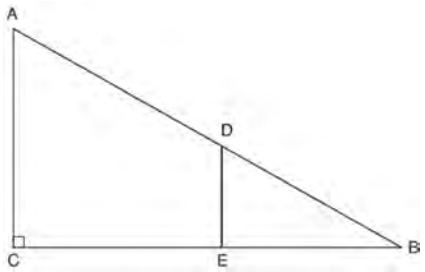
39 On the set of axes below, $\triangle RST$ is the image of $\triangle ABC$ after a dilation centered at point P.



The scale factor of the dilation that maps $\triangle ABC$ onto $\triangle RST$ is

40 In right triangle ABC shown below, point D is on $\overline{AB}$ and point E is on $\overline{CB}$ such that $\overline{AC} \parallel \overline{DE}$.



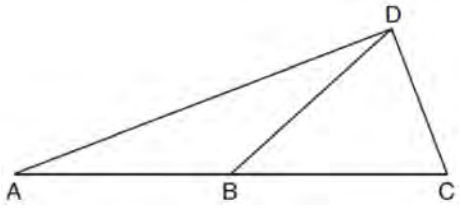
If $AB = 15$, $BC = 12$, and $EC = 7$, what is the length of $\overline{BD}$?

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

42 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°?

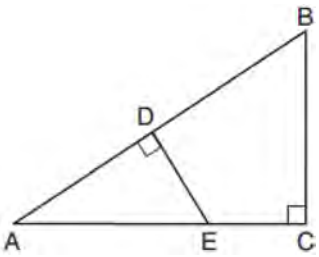
43 In $\triangle ABC$, where $\angle C$ is a right angle, $\cos A = \frac{\sqrt{21}}{5}$. What is $\sin B$?

44 In the diagram below of $\triangle ACD$, $\overline{DB}$ is a median to $\overline{AC}$, and $\overline{AB} \cong \overline{DB}$.



If $m\angle DAB = 32°$, what is $m\angle BDC$?

45 In $\triangle ABC$ shown below, $\angle ACB$ is a right angle, E is a point on $\overline{AC}$, and $\overline{ED}$ is drawn perpendicular to hypotenuse $\overline{AB}$.



If $AB = 9$, $BC = 6$, and $DE = 4$, what is the length of $\overline{AE}$?

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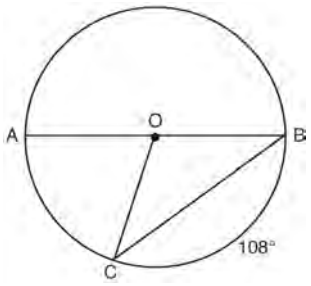
46 An equation of a line perpendicular to the line represented by the equation $y = -\frac{1}{2}x - 5$ and passing through $(6, -4)$ is

47 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?

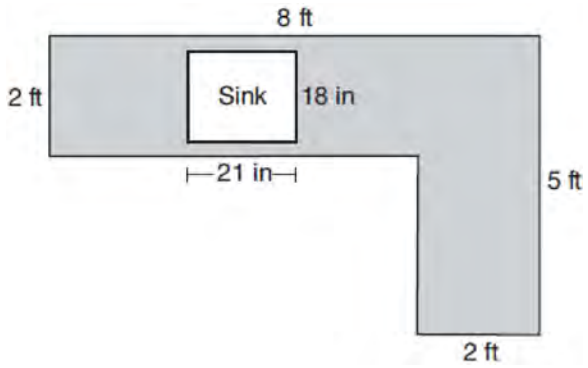
48 Lou has a solid clay brick in the shape of a rectangular prism with a length of 8 inches, a width of 3.5 inches, and a height of 2.25 inches. If the clay weighs 1.055 oz/in^3, how much does Lou's brick weigh, to the *nearest ounce*?

49 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*?

50 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?

51 Jaden is comparing two cones. The radius of the base of cone *A* is twice as large as the radius of the base of cone *B*. The height of cone *B* is twice the height of cone *A*. The volume of cone *A* is

52 A countertop for a kitchen is modeled with the dimensions shown below. An 18-inch by 21-inch rectangle will be removed for the installation of the sink.



What is the area of the top of the installed countertop, to the *nearest square foot*?

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

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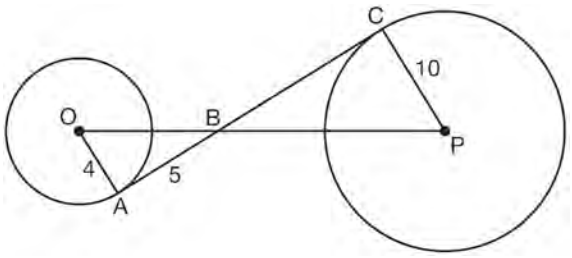
54 In the diagram shown below, $\overline{AC}$ is tangent to circle O at A and to circle P at C, $\overline{OP}$ intersects $\overline{AC}$ at B, $OA = 4$, $AB = 5$, and $PC = 10$.



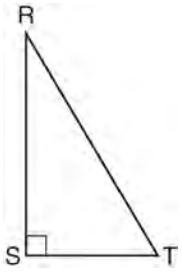
What is the length of $\overline{BC}$?

55 For the acute angles in a right triangle, $\sin(4x)° = \cos(3x + 13)°$. What is the number of degrees in the measure of the *smaller* angle?

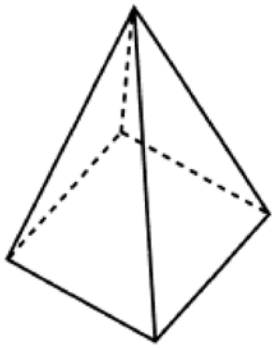
56 An equilateral triangle has sides of length 20. To the *nearest tenth*, what is the height of the equilateral triangle?

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

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



59 The square pyramid below models a toy block made of maple wood.



Each side of the base measures 4.5 cm and the height of the pyramid is 10 cm. If the density of maple is 0.676 g/cm^3, what is the mass of the block, to the *nearest tenth of a gram*?

60 Which regular polygon has a minimum rotation of 36° about its center that carries the polygon onto itself?

61 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 $\overline{AB}$?

62 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?

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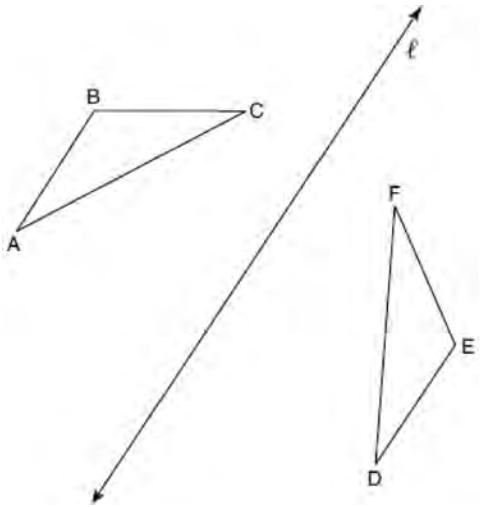
63 What is an equation of a circle whose center is at $(2,-4)$ and is tangent to the line $x = -2$?

64 In the diagram below, $\triangle ABC$ is reflected over line ℓ to create $\triangle DEF$.



If $m\angle A = 40°$ and $m\angle B = 95°$, what is $m\angle F$?

65 Square *MATH* has a side length of 7 inches. Which three-dimensional object will be formed by continuously rotating square *MATH* around side $\overline{AT}$?

66 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?

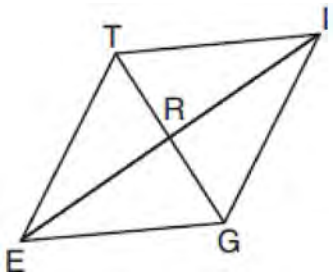
67 A cone has a volume of 108π and a base diameter of 12. What is the height of the cone?

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

69 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?

70 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*?

71 In rhombus *TIGE*, diagonals $\overline{TG}$ and $\overline{IE}$ intersect at *R*. The perimeter of *TIGE* is 68, and $TG = 16$.



What is the length of diagonal $\overline{IE}$?

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

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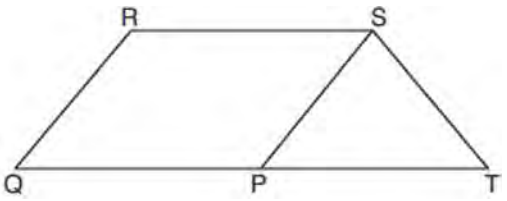
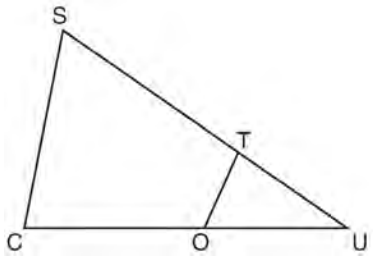
73 In parallelogram $PQRS$, $\overline{QP}$ is extended to point T and $\overline{ST}$ is drawn.



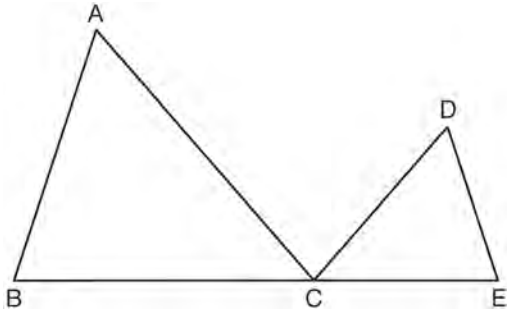
If $\overline{ST} \cong \overline{SP}$ and $m\angle R = 130°$, what is $m\angle PST$?

74 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 $\overline{ST}$?

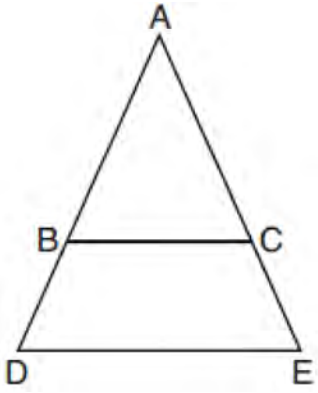
75 In the diagram below, $\triangle ABC \sim \triangle DEC$.



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

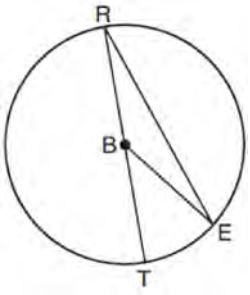
76 Diameter $\overline{ROQ}$ of circle O is extended through Q to point P, and tangent $\overline{PA}$ is drawn. If $m\overset{\frown}{RA} = 100°$, what is $m\angle P$?

77 In the diagram below, $\overline{BC}$ connects points B and C on the congruent sides of isosceles triangle ADE, such that $\triangle ABC$ is isosceles with vertex angle A.



If $AB = 10$, $BD = 5$, and $DE = 12$, what is the length of $\overline{BC}$?

78 In circle B below, diameter $\overline{RT}$, radius $\overline{BE}$, and chord $\overline{RE}$ are drawn.



If $m\angle TRE = 15°$ and $BE = 9$, then the area of sector EBR is

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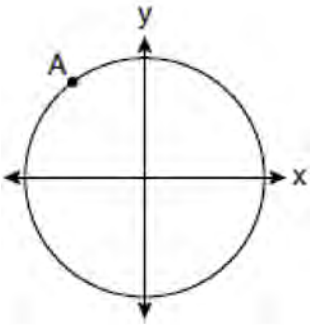
79 What is the volume, in cubic centimeters, of a right square pyramid with base edges that are 64 cm long and a slant height of 40 cm?

80 A standard-size golf ball has a diameter of 1.680 inches. The material used to make the golf ball weighs 0.6523 ounce per cubic inch. What is the weight, to the *nearest hundredth of an ounce*, of one golf ball?

81 In right triangle *RST*, altitude $\overline{TV}$ is drawn to hypotenuse $\overline{RS}$. If $RV = 12$ and $RT = 18$, what is the length of $\overline{SV}$?

82 A circle centered at the origin passes through $A(-3,4)$.

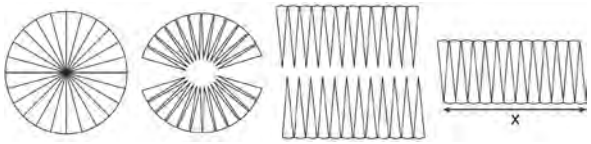


What is the equation of the line tangent to the circle at *A*?

83 The equation of a circle is $x^2 + 8x + y^2 - 12y = 144$. What are the coordinates of the center and the length of the radius of the circle?

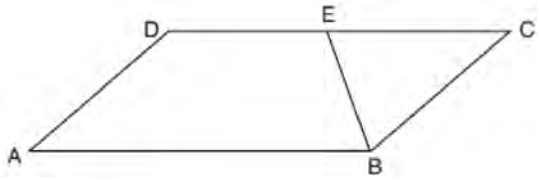
84 After a dilation centered at the origin, the image of $\overline{CD}$ is $\overline{C'D'}$. If the coordinates of the endpoints of these segments are $C(6,-4)$, $D(2,-8)$, $C'(9,-6)$, and $D'(3,-12)$, the scale factor of the dilation is

85 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

86 In parallelogram *ABCD* shown below, $\overline{EB}$ bisects $\angle ABC$.



If $m\angle A = 40°$, then $m\angle BED$ is

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

88 Which figure(s) below can have a triangle as a two-dimensional cross section?

I. cone
II. cylinder
III. cube
IV. square pyramid

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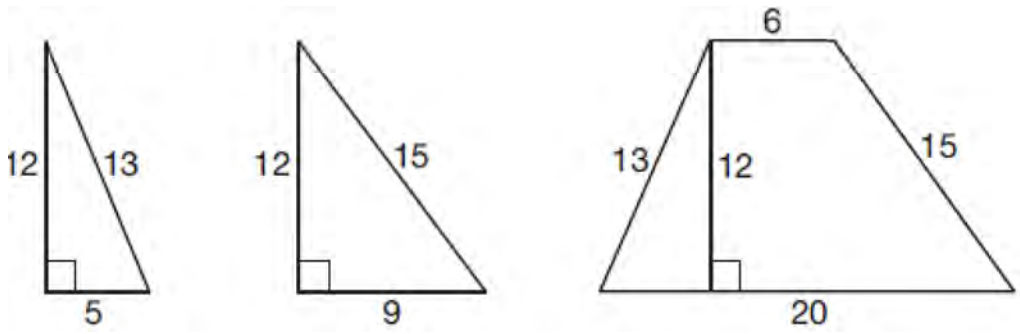
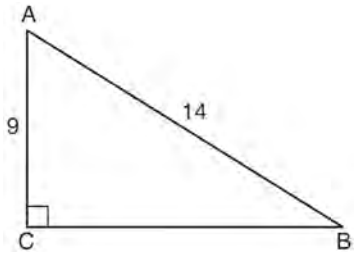
89 Francisco needs the three pieces of glass shown below to complete a stained glass window. The shapes, two triangles and a trapezoid, are measured in inches.



Glass can be purchased in rectangular sheets that are 12 inches wide. What is the minimum length of a sheet of glass, in inches, that Francisco must purchase in order to have enough to complete the window?

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

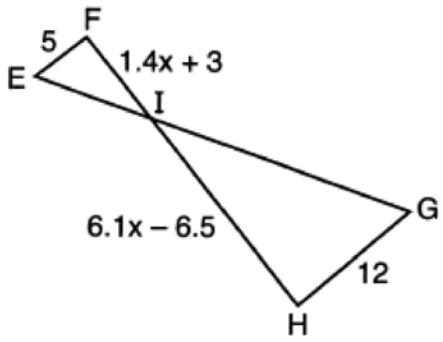


What is the measure of $\angle A$, to the *nearest degree*?

91 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?

92 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?

93 In the diagram below, $\overline{EF} \parallel \overline{HG}$, $EF = 5$, $HG = 12$, $FI = 1.4x + 3$, and $HI = 6.1x - 6.5$.



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

94 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?

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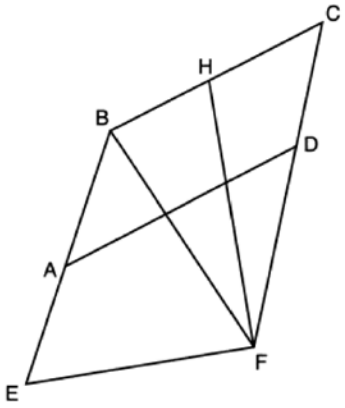
95 The diameter of a basketball is approximately 9.5 inches and the diameter of a tennis ball is approximately 2.5 inches. The volume of the basketball is about how many times greater than the volume of the tennis ball?

96 The coordinates of the vertices of parallelogram $CDEH$ are $C(-5,5)$, $D(2,5)$, $E(-1,-1)$, and $H(-8,-1)$. What are the coordinates of P, the point of intersection of diagonals $\overline{CE}$ and $\overline{DH}$?

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

98 In rhombus $VENU$, diagonals $\overline{VN}$ and $\overline{EU}$ intersect at S. If $VN = 12$ and $EU = 16$, what is the perimeter of the rhombus?

99 Quadrilateral $EBCF$ and $\overline{AD}$ are drawn below, such that $ABCD$ is a parallelogram, $\overline{EB} \cong \overline{FB}$, and $\overline{EF} \perp \overline{FH}$.



If $m\angle E = 62°$ and $m\angle C = 51°$, what is $m\angle FHB$?

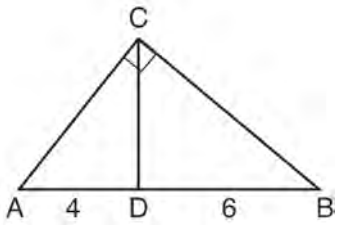
100 Point M divides $\overline{AB}$ so that $AM:MB = 1:2$. If A has coordinates $(-1,-3)$ and B has coordinates $(8,9)$, the coordinates of M are

101 The Pyramid of Memphis, in Tennessee, stands 107 yards tall and has a square base whose side is 197 yards long.

What is the volume of the Pyramid of Memphis, to the *nearest cubic yard*?

102 If the altitudes of a triangle meet at one of the triangle's vertices, then the triangle is

103 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 $\overline{CD} \perp \overline{AB}$?

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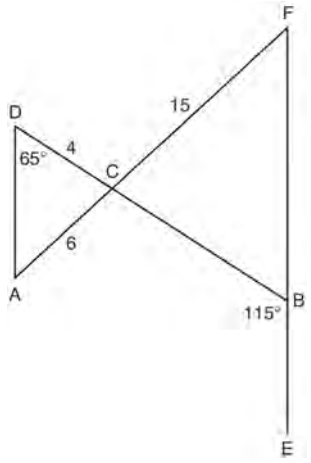
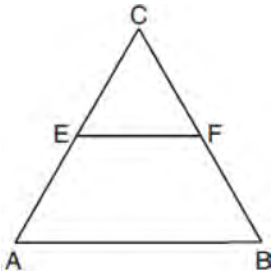
104 In the diagram below, $\overline{DB}$ and $\overline{AF}$ intersect at point C, and $\overline{AD}$ and $\overline{FBE}$ are drawn.



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

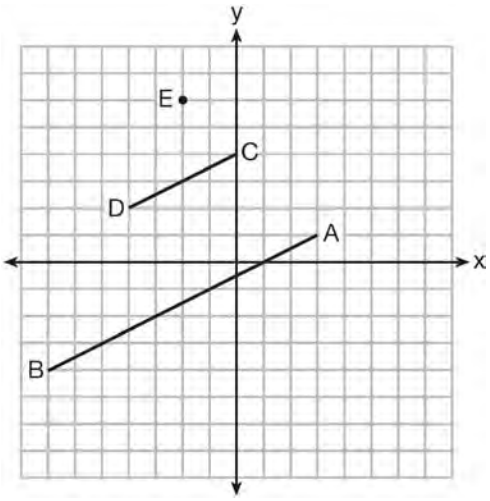
105 In the diagram of equilateral triangle ABC shown below, E and F are the midpoints of $\overline{AC}$ and $\overline{BC}$, respectively.



If $EF = 2x + 8$ and $AB = 7x - 2$, what is the perimeter of trapezoid $ABFE$?

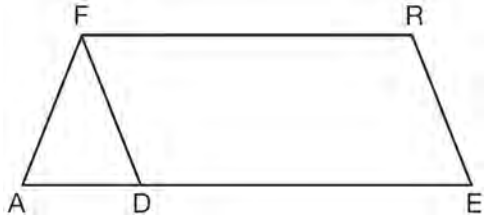
106 The endpoints of directed line segment PQ have coordinates of $P(-7,-5)$ and $Q(5,3)$. What are the coordinates of point A, on $\overline{PQ}$, that divide $\overline{PQ}$ into a ratio of 1:3?

107 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?

108 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 $m\angle AFD$?

109 The line represented by $2y = x + 8$ is dilated by a scale factor of k centered at the origin, such that the image of the line has an equation of $y - \frac{1}{2}x = 2$. What is the scale factor?

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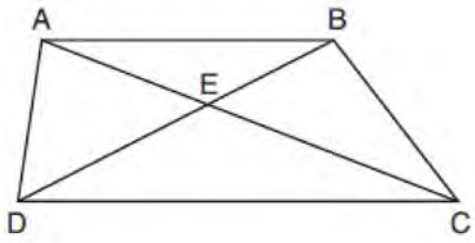
110 Point P divides the directed line segment from point $A(-4,-1)$ to point $B(6,4)$ in the ratio 2:3. The coordinates of point P are

111 In trapezoid $ABCD$ below, $\overline{AB} \parallel \overline{CD}$.



If $AE = 5.2$, $AC = 11.7$, and $CD = 10.5$, what is the length of $\overline{AB}$, to the *nearest tenth*?

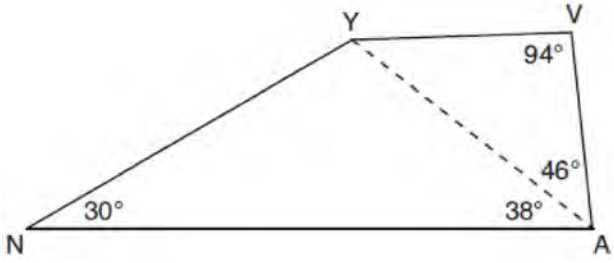
112 Tennis balls are sold in cylindrical cans with the balls stacked one on top of the other. A tennis ball has a diameter of 6.7 cm. To the *nearest cubic centimeter*, what is the minimum volume of the can that holds a stack of 4 tennis balls?

113 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?

114 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?

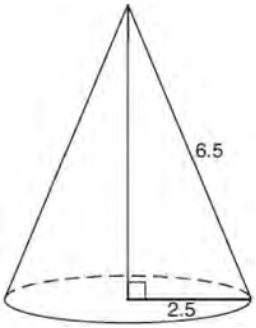
115 The cross section of a regular pyramid contains the altitude of the pyramid. The shape of this cross section is a

116 In the diagram of quadrilateral $NAVY$ below, $m\angle YNA = 30°$, $m\angle YAN = 38°$, $m\angle AVY = 94°$, and $m\angle VAY = 46°$.



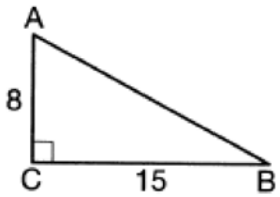
Which segment has the shortest length?

117 As shown in the diagram below, the radius of a cone is 2.5 cm and its slant height is 6.5 cm.



How many cubic centimeters are in the volume of the cone?

118 As shown in the diagram below, right triangle ABC has side lengths of 8 and 15.



If the triangle is continuously rotated about $\overline{AC}$, the resulting figure will be

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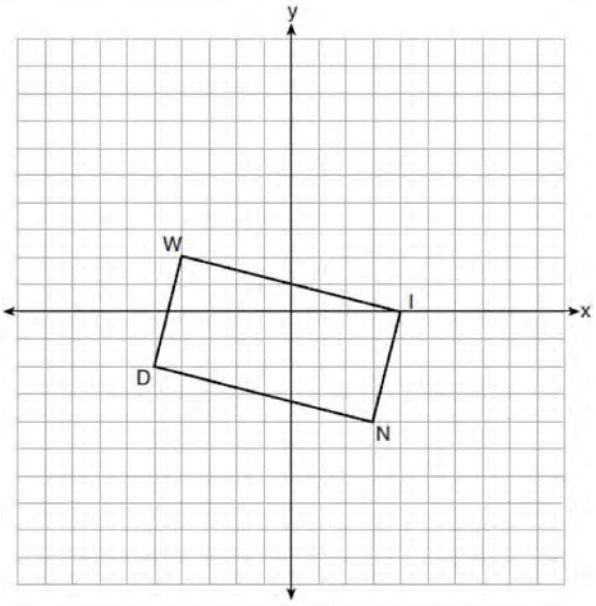
119 On the set of axes below, rectangle *WIND* has vertices with coordinates $W(-4,2)$, $I(4,0)$, $N(3,-4)$, and $D(-5,-2)$.



What is the area of rectangle *WIND*?

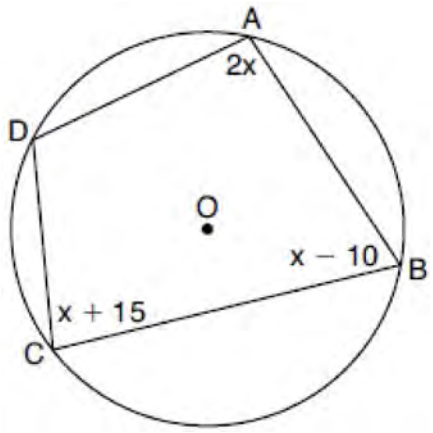
120 What are the coordinates of the center and the length of the radius of the circle represented by the equation $x^2 + y^2 - 4x + 8y + 11 = 0$?

121 Which three-dimensional figure will result when a rectangle 6 inches long and 5 inches wide is continuously rotated about the longer side?

122 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*?

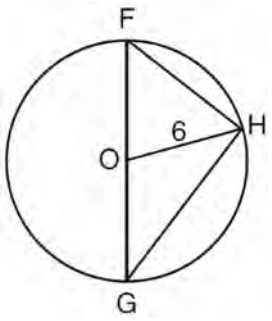
123 If a rectangle is continuously rotated around one of its sides, what is the three-dimensional figure formed?

124 In the diagram below, quadrilateral *ABCD* is inscribed in circle *O*, $m\angle A = (2x)°$, $m\angle B = (x - 10)°$, and $m\angle C = (x + 15)°$.



What is $m\angle D$?

125 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*?

126 From a point on the ground one-half mile from the base of a historic monument, the angle of elevation to its top is 11.87°. To the *nearest foot*, what is the height of the monument?

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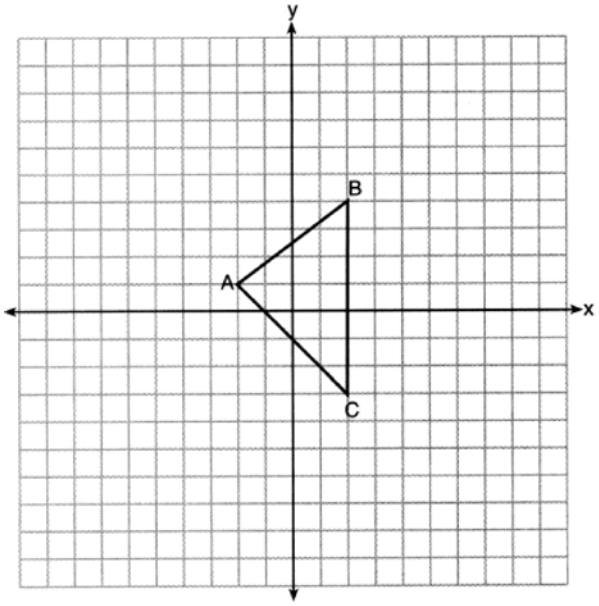
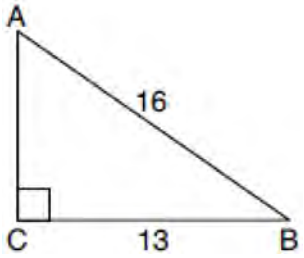
127 Segment JM has endpoints $J(-5,1)$ and $M(7,-9)$. An equation of the perpendicular bisector of $\overline{JM}$ is

128 Triangle $A'B'C'$ is the image of $\triangle ABC$ after a dilation centered at the origin. The coordinates of the vertices of $\triangle ABC$ are $A(-2,1)$, $B(2,4)$, and $C(2,-3)$.



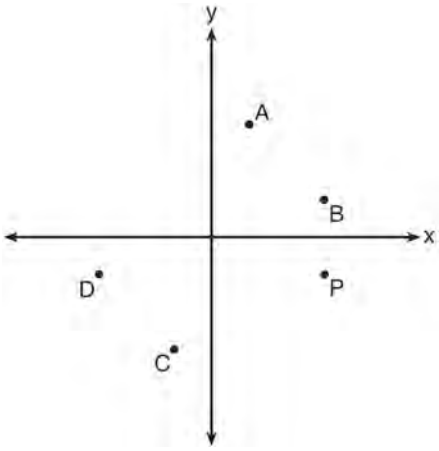
If the coordinates of A' are $(-4,2)$, the coordinates of B' are

129 In the diagram of $\triangle ABC$ below, $m\angle C = 90°$, $CB = 13$, and $AB = 16$.

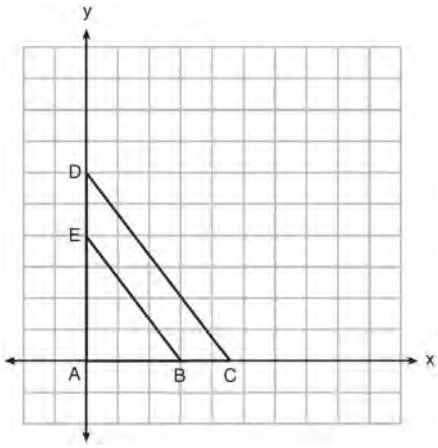


What is the measure of $\angle A$, to the *nearest degree*?

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



131 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

132 After a dilation with center $(0,0)$, the image of $\overline{DB}$ is $\overline{D'B'}$. If $DB = 4.5$ and $D'B' = 18$, the scale factor of this dilation is

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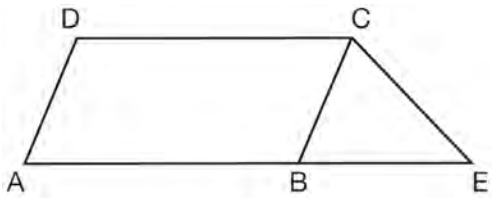
133 If the rectangle below is continuously rotated about side *w*, which solid figure is formed?

134 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?

135 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

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



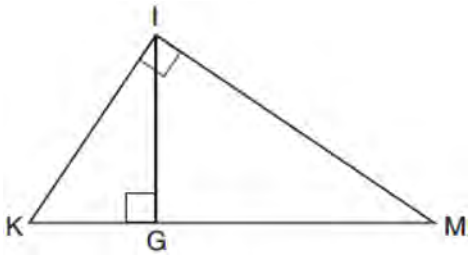
If $\overline{CE} \cong \overline{BE}$ and $m\angle D = 112°$, what is $m\angle E$?

137 A tent is in the shape of a right pyramid with a square floor. The square floor has side lengths of 8 feet. If the height of the tent at its center is 6 feet, what is the volume of the tent, in cubic feet?

138 What is the volume of a hemisphere that has a diameter of 12.6 cm, to the *nearest tenth of a cubic centimeter*?

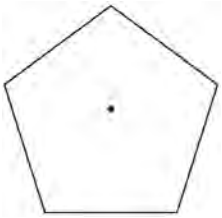
139 The endpoints of one side of a regular pentagon are $(-1,4)$ and $(2,3)$. What is the perimeter of the pentagon?

140 In the diagram below of right triangle *KMI*, altitude $\overline{IG}$ is drawn to hypotenuse $\overline{KM}$.



If $KG = 9$ and $IG = 12$, the length of $\overline{IM}$ is

141 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

142 Chelsea is sitting 8 feet from the foot of a tree. From where she is sitting, the angle of elevation of her line of sight to the top of the tree is 36°. If her line of sight starts 1.5 feet above ground, how tall is the tree, to the *nearest foot*?

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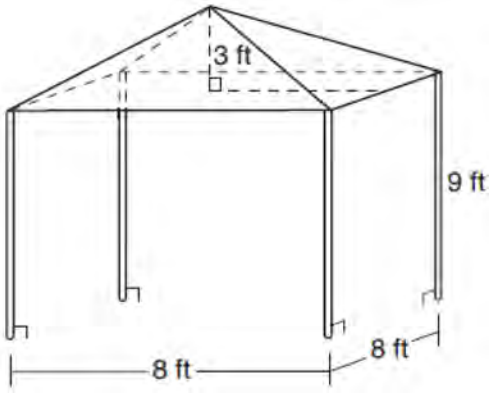
143 What are the coordinates of point C on the directed segment from $A(-8,4)$ to $B(10,-2)$ that partitions the segment such that $AC{:}CB$ is 2:1?

144 A vendor is using an 8-ft by 8-ft tent for a craft fair. The legs of the tent are 9 ft tall and the top forms a square pyramid with a height of 3 ft.



What is the volume, in cubic feet, of space the tent occupies?

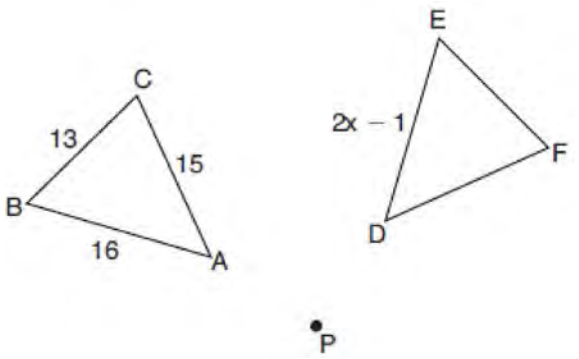
145 A hemispherical water tank has an inside diameter of 10 feet. If water has a density of 62.4 pounds per cubic foot, what is the weight of the water in a full tank, to the *nearest pound*?

146 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?

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

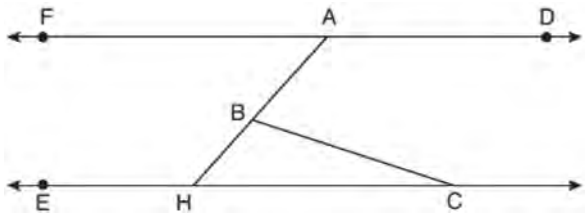
148 What is an equation of the image of the line $y = \frac{3}{2}x - 4$ after a dilation of a scale factor of $\frac{3}{4}$ centered at the origin?

149 In the diagram below, $\triangle ABC$ with sides 13, 15, and 16, is mapped onto $\triangle DEF$ after a clockwise rotation of 90° about point P.



If $DE = 2x - 1$, what is the value of x?

150 In the diagram below, $\overline{FAD} \parallel \overline{EHC}$, and $\overline{ABH}$ and $\overline{BC}$ are drawn.



If $m\angle FAB = 48°$ and $m\angle ECB = 18°$, what is $m\angle ABC$?

151 In circle O two secants, $\overline{ABP}$ and $\overline{CDP}$, are drawn to external point P. If $m\overset{\frown}{AC} = 72°$, and $m\overset{\frown}{BD} = 34°$, what is the measure of $\angle P$?

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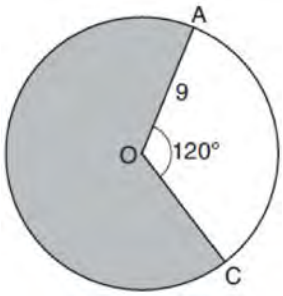
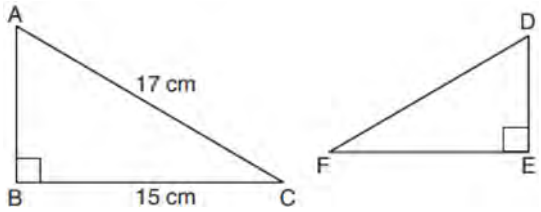
152 What are the coordinates of the center and the length of the radius of the circle whose equation is $x^2 + y^2 = 8x - 6y + 39$?

153 Circle *O* with a radius of 9 is drawn below. The measure of central angle *AOC* is 120°.



What is the area of the shaded sector of circle *O*?

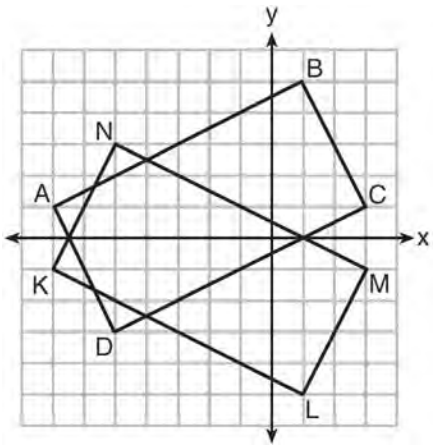
154 Kayla was cutting right triangles from wood to use for an art project. Two of the right triangles she cut are shown below.



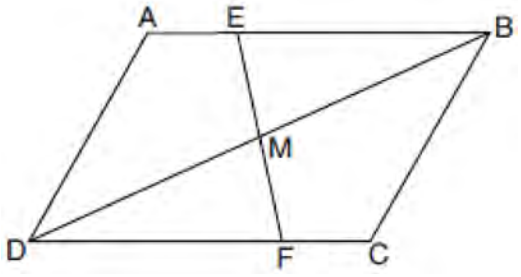
If $\triangle ABC \sim \triangle DEF$, with right angles *B* and *E*, *BC* = 15 cm, and *AC* = 17 cm, what is the measure of $\angle F$, to the *nearest degree*?

155 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

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



157 Parallelogram *ABCD* with diagonal $\overline{DB}$ is drawn below. Line segment *EF* is drawn such that it bisects $\overline{DB}$ at *M*.



Which triangle congruence method would prove that $\triangle EMB \sim \triangle FMD$?

158 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?

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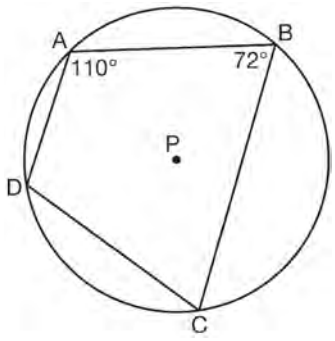
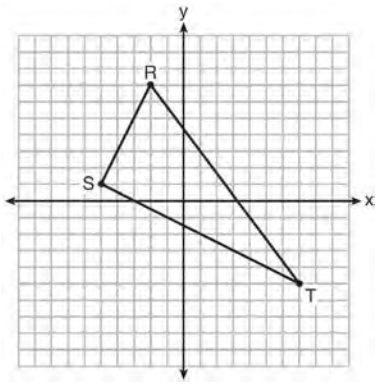
159 In the diagram below, quadrilateral *ABCD* is inscribed in circle *P*.



What is m∠*ADC*?

160 Triangle *RST* is graphed on the set of axes below.

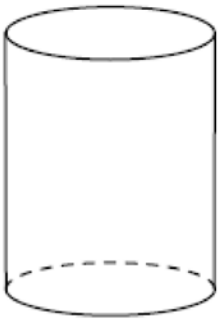


How many square units are in the area of $\triangle RST$?

161 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?

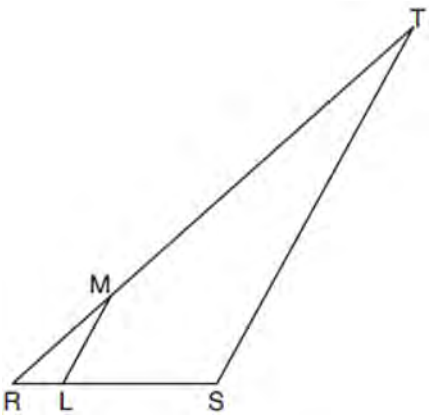
162 Line $y = 3x - 1$ is transformed by a dilation with a scale factor of 2 and centered at $(3,8)$. The line's image is

163 A plane intersects a cylinder perpendicular to its bases.



This cross section can be described as a

164 In the diagram below of $\triangle RST$, *L* is a point on $\overline{RS}$, and *M* is a point on $\overline{RT}$, such that $LM \parallel ST$.



If $RL = 2$, $LS = 6$, $LM = 4$, and $ST = x + 2$, what is the length of $\overline{ST}$?

165 The area of a sector of a circle with a radius measuring 15 cm is 75π cm^2. What is the measure of the central angle that forms the sector?

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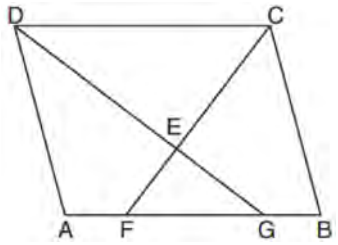
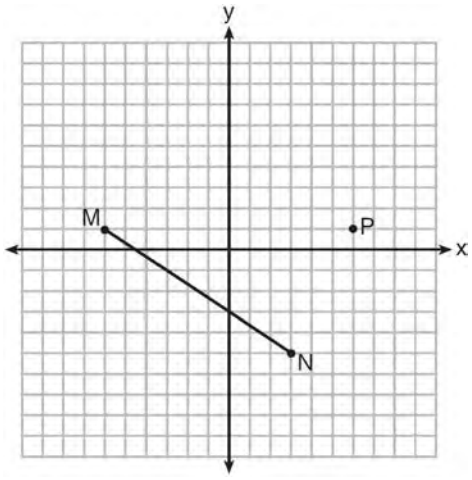
166 In the diagram below of parallelogram *ABCD*, $\overline{AFGB}$, $\overline{CF}$ bisects $\angle DCB$, $\overline{DG}$ bisects $\angle ADC$, and $\overline{CF}$ and $\overline{DG}$ intersect at *E*.



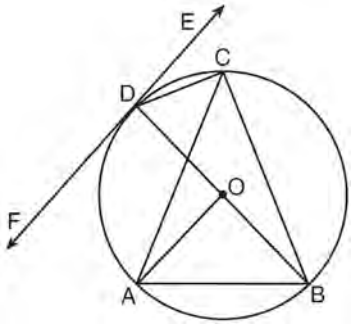
If m$\angle B = 75°$, then the measure of $\angle EFA$ is

167 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 $\overline{MN}$?



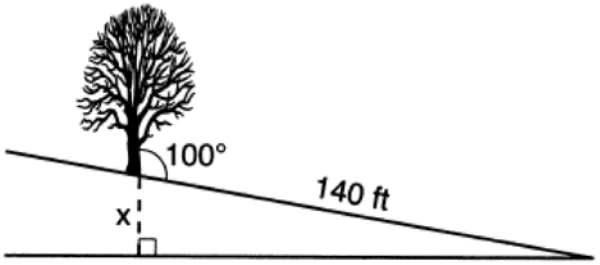
168 A water cup in the shape of a cone has a height of 4 inches and a maximum diameter of 3 inches. What is the volume of the water in the cup, to the *nearest tenth of a cubic inch*, when the cup is filled to half its height?

169 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?

170 The diagram below shows a tree growing vertically on a hillside. The angle formed by the tree trunk and the hillside is 100°. The distance from the base of the tree to the bottom of the hill is 140 feet.



What is the vertical drop, *x*, to the base of the hill, to the *nearest foot*?

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

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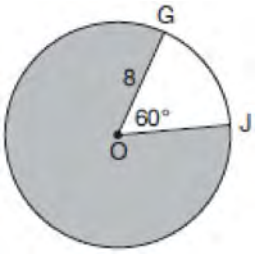
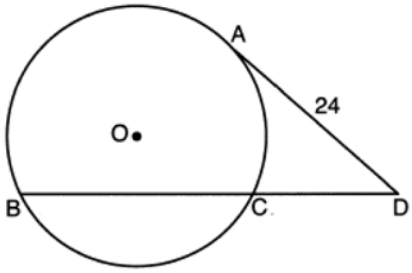
172 In the diagram below of circle O, $GO = 8$ and $m\angle GOJ = 60°$.



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

173 What is an equation of the line that passes through the point $(6,8)$ and is perpendicular to a line with equation $y = \frac{3}{2}x + 5$?

174 Circle O is drawn below with secant $\overline{BCD}$. The length of tangent $\overline{AD}$ is 24.

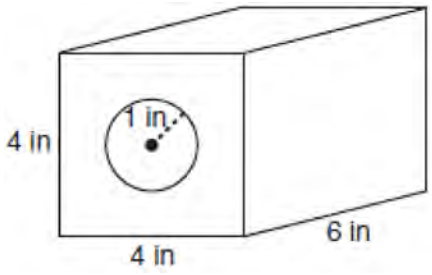


If the ratio of $DC:CB$ is 4:5, what is the length of $\overline{CB}$?

175 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

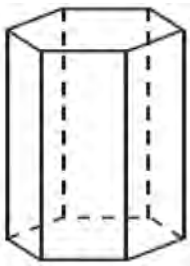
176 A plane intersects a hexagonal prism. The plane is perpendicular to the base of the prism. Which two-dimensional figure is the cross section of the plane intersecting the prism?

177 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?

178 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?

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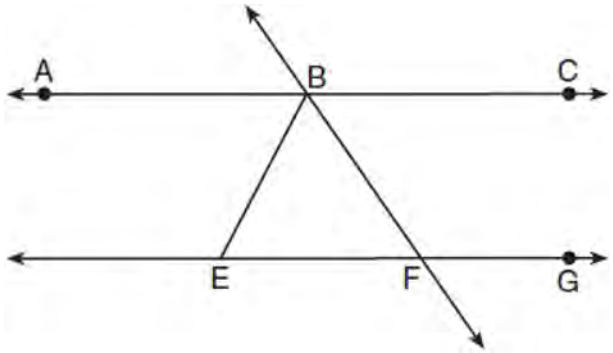
179 A child's tent can be modeled as a pyramid with a square base whose sides measure 60 inches and whose height measures 84 inches. What is the volume of the tent, to the *nearest cubic foot*?

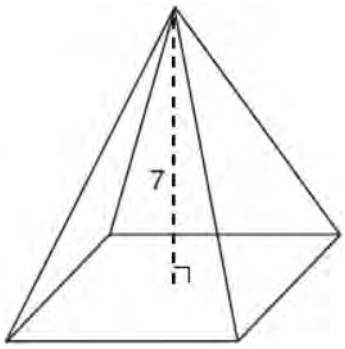
180 Line segment RW has endpoints $R(-4,5)$ and $W(6,20)$. Point P is on $\overline{RW}$ such that $RP{:}PW$ is 2:3. What are the coordinates of point P?

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



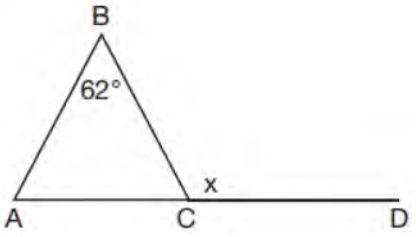
If $m\angle CBF = 42.5°$, then $m\angle EBF$ is

182 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?

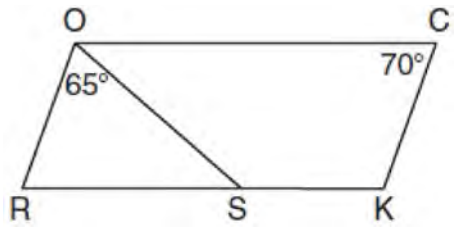
183 Given $\triangle ABC$ with $m\angle B = 62°$ and side $\overline{AC}$ extended to D, as shown below.



Which value of x makes $\overline{AB} \cong \overline{CB}$?

184 What is an equation of a line that is perpendicular to the line whose equation is $2y = 3x - 10$ and passes through $(-6,1)$?

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



What is $m\angle KSO$?

186 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*?

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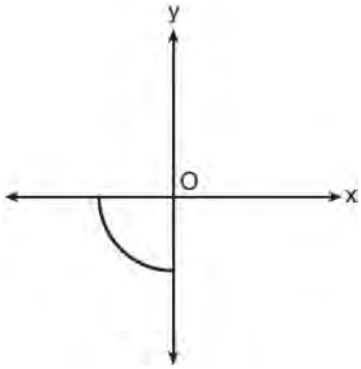
187 The 2010 U.S. Census populations and population densities are shown in the table below.

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?

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



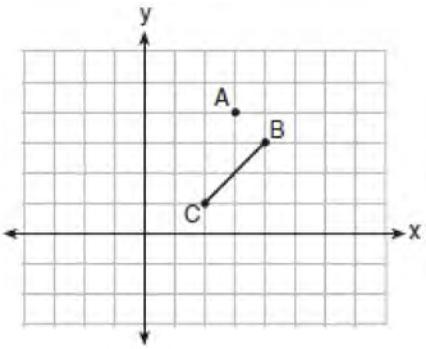
Which three-dimensional figure is generated when the quarter circle is continuously rotated about the y-axis?

189 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?

190 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?

191 The measure of one of the base angles of an isosceles triangle is 42°. The measure of an exterior angle at the vertex of the triangle is

192 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?

193 In $\triangle ABC$, $\overline{BD}$ is the perpendicular bisector of $\overline{ADC}$. Based upon this information, which statements below can be proven?

I. $\overline{BD}$ is a median.
II. $\overline{BD}$ bisects $\angle ABC$.
III. $\triangle ABC$ is isosceles.

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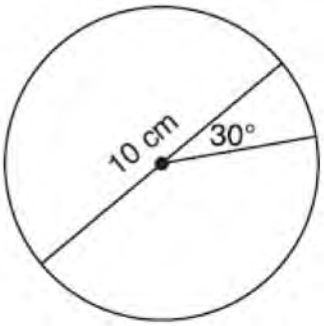
194 In right triangle *ABC*, hypotenuse $\overline{AB}$ has a length of 26 cm, and side $\overline{BC}$ has a length of 17.6 cm. What is the measure of angle *B*, to the *nearest degree*?

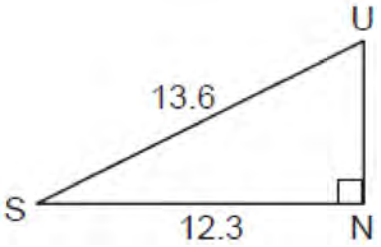
195 Line *MN* is dilated by a scale factor of 2 centered at the point $(0,6)$. If $\overleftrightarrow{MN}$ is represented by $y = -3x + 6$, which equation can represent $\overleftrightarrow{M'N'}$, the image of $\overleftrightarrow{MN}$?

196 A circle with a diameter of 10 cm and a central angle of 30° is drawn below.



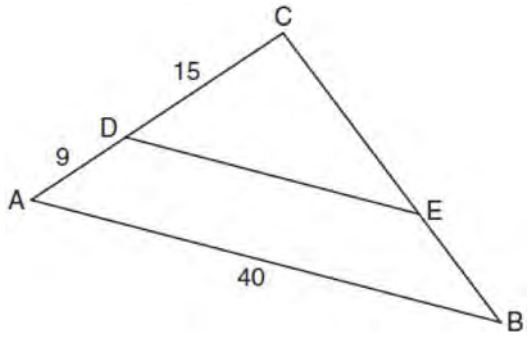
What is the area, to the *nearest tenth of a square centimeter*, of the sector formed by the 30° angle?

197 In the diagram below of right triangle *SUN*, where $\angle N$ is a right angle, *SU* = 13.6 and *SN* = 12.3.



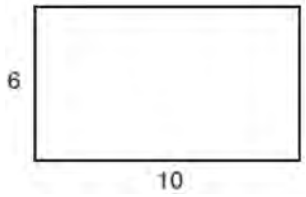
What is $\angle S$, to the *nearest degree*?

198 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

199 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?

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

201 Rectangle *ABCD* has two vertices at coordinates $A(-1,-3)$ and $B(6,5)$. The slope of $\overline{BC}$ is

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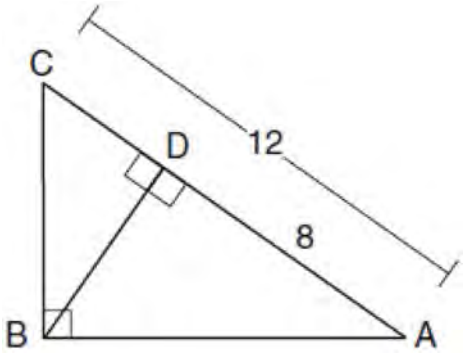
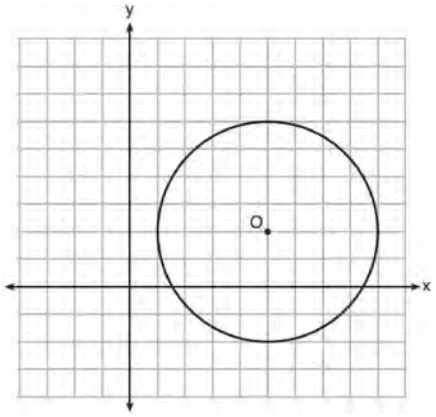
202 The endpoints of $\overline{AB}$ are $A(0,4)$ and $B(-4,6)$. Which equation of a line represents the perpendicular bisector of $\overline{AB}$?

203 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 $\overline{BC}$?

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

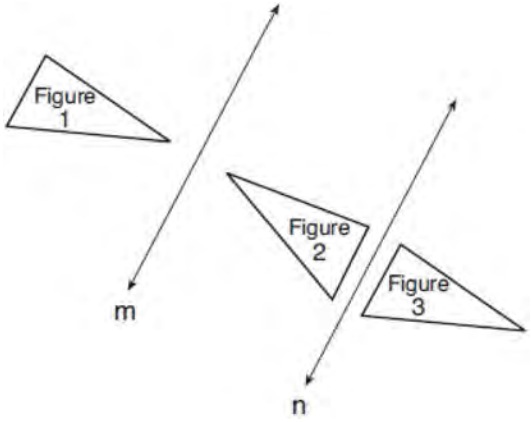


205 The line whose equation is $6x + 3y = 3$ is dilated by a scale factor of 2 centered at the point $(0,0)$. An equation of its image is

206 Directed line segment DE has endpoints $D(-4,-2)$ and $E(1,8)$. Point F divides $\overline{DE}$ such that $DF:FE$ is 2:3. What are the coordinates of F?

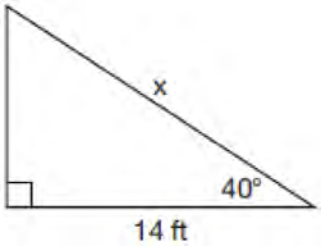
207 A regular pyramid has a square base. The perimeter of the base is 36 inches and the height of the pyramid is 15 inches. What is the volume of the pyramid in cubic inches?

208 In the diagram below, line m is parallel to line n. Figure 2 is the image of Figure 1 after a reflection over line m. Figure 3 is the image of Figure 2 after a reflection over line n.



Which single transformation would carry Figure 1 onto Figure 3?

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



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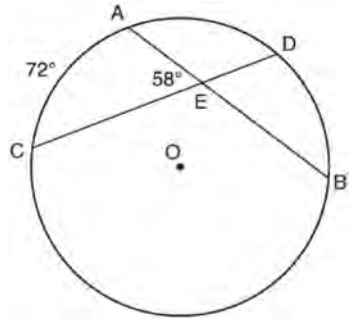
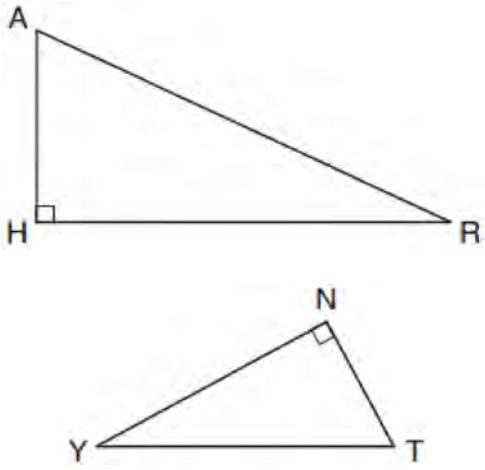
210 In the diagram below of circle O, chords $\overline{AB}$ and $\overline{CD}$ intersect at E.



If $m\overset{\frown}{AC} = 72°$ and $m\angle AEC = 58°$, how many degrees are in $m\overset{\frown}{DB}$?

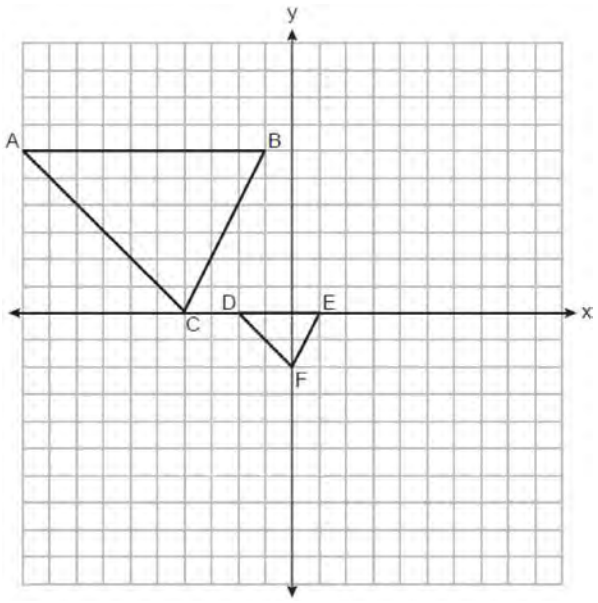
211 In the diagram below of $\triangle HAR$ and $\triangle NTY$, angles H and N are right angles, and $\triangle HAR \sim \triangle NTY$.



If $AR = 13$ and $HR = 12$, what is the measure of angle Y, to the *nearest degree*?

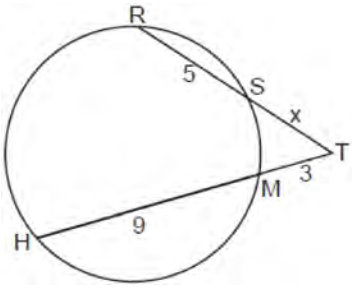
212 A cylindrical pool has a diameter of 16 feet and height of 4 feet. The pool is filled to $\frac{1}{2}$ foot below the top. How much water does the pool contain, to the *nearest gallon*? [1 ft^3 = 7.48 gallons]

213 On the set of axes below, $\triangle DEF$ is the image of $\triangle ABC$ after a dilation of scale factor $\frac{1}{3}$.



The center of dilation is at

214 In the circle below, secants $\overline{TSR}$ and $\overline{TMH}$ intersect at T, $SR = 5$, $HM = 9$, $TM = 3$, and $TS = x$.



Which equation could be used to find the value of x?

215 If $\sin(2x + 7)° = \cos(4x - 7)°$, what is the value of x?

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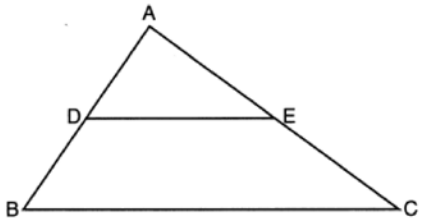
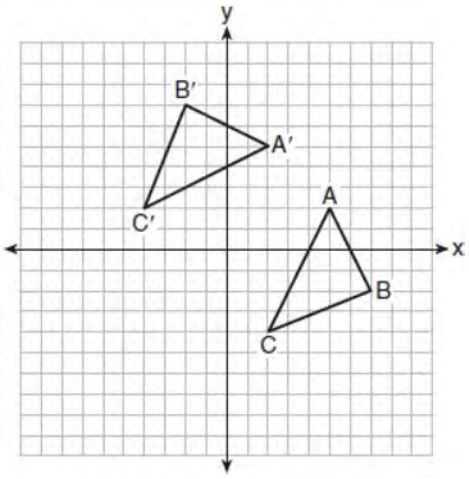
216 In the diagram below of $\triangle ABC$, D and E are the midpoints of $\overline{AB}$ and $\overline{AC}$, respectively, and $\overline{DE}$ is drawn.



I. AA similarity
II. SSS similarity
III. SAS similarity

Which methods could be used to prove $\triangle ABC \sim \triangle ADE$?

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



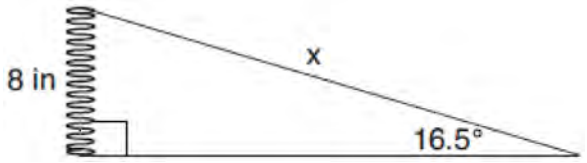
Which rigid motion would map $\triangle ABC$ onto $\triangle A'B'C'$?

218 Given square $RSTV$, where $RS = 9$ cm. If square $RSTV$ is dilated by a scale factor of 3 about a given center, what is the perimeter, in centimeters, of the image of $RSTV$ after the dilation?

219 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

220 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 $RSTV$?

221 Yolanda is making a springboard to use for gymnastics. She has 8-inch-tall springs and wants to form a 16.5° angle with the base, as modeled in the diagram below.



To the *nearest tenth of an inch*, what will be the length of the springboard, x?

222 Triangle RJM has an area of 6 and a perimeter of 12. If the triangle is dilated by a scale factor of 3 centered at the origin, what are the area and perimeter of its image, triangle $R'J'M'$?

223 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. $AA' = BB'$

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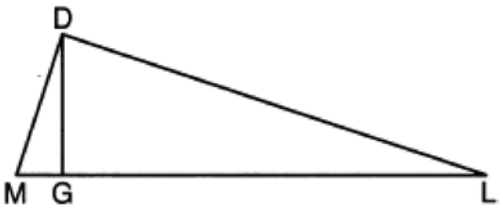
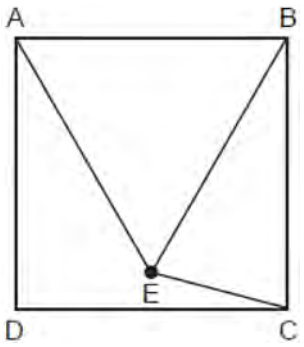
224 In the diagram below of right triangle MDL, altitude $\overline{DG}$ is drawn to hypotenuse $\overline{ML}$.



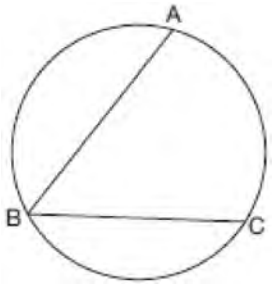
If $MG = 3$ and $GL = 24$, what is the length of $\overline{DG}$?

225 In the diagram below, point E is located inside square $ABCD$ such that $\triangle ABE$ is equilateral, and $\overline{CE}$ is drawn.



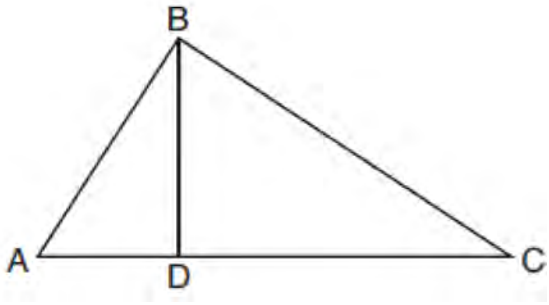
What is $m\angle BEC$?

226 In the diagram below, $m\overset{\frown}{ABC} = 268°$.



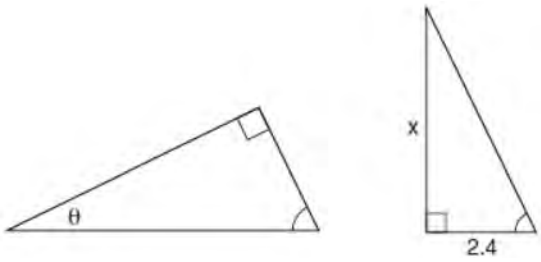
What is the number of degrees in the measure of $\angle ABC$?

227 In the diagram below of right triangle ABC, altitude $\overline{BD}$ is drawn to hypotenuse $\overline{AC}$.



If $BD = 4$, $AD = x - 6$, and $CD = x$, what is the length of $\overline{CD}$?

228 The diagram below shows two similar triangles.



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

229 The equation of a line is $3x - 5y = 8$. All lines perpendicular to this line must have a slope of

230 What are the coordinates of the center and length of the radius of the circle whose equation is $x^2 + y^2 + 2x - 16y + 49 = 0$?

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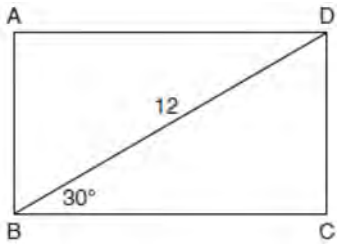
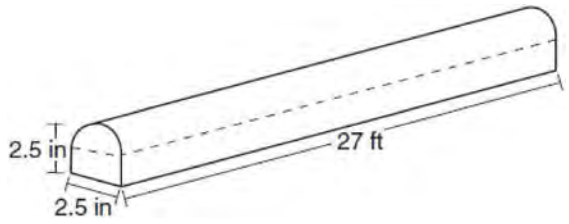
231 The diagram shows rectangle *ABCD*, with diagonal $\overline{BD}$.



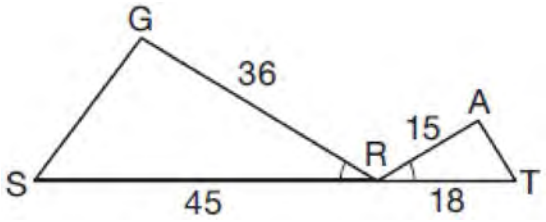
What is the perimeter of rectangle *ABCD*, to the *nearest tenth*?

232 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.



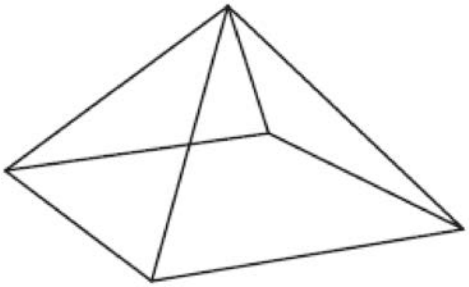
How much metal, to the *nearest cubic inch*, will the railing contain?

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



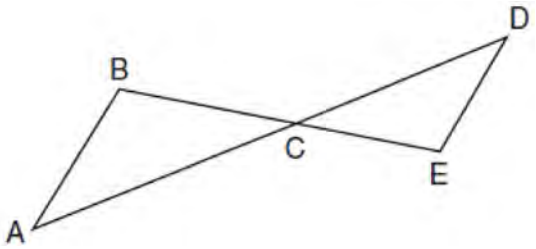
Which triangle similarity statement is correct?

234 A square pyramid is intersected by a plane passing through the vertex and perpendicular to the base.



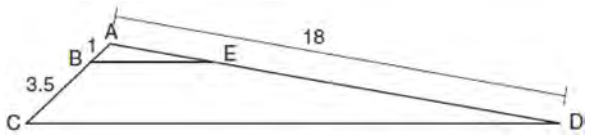
Which two-dimensional shape describes this cross section?

235 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*?

236 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*?

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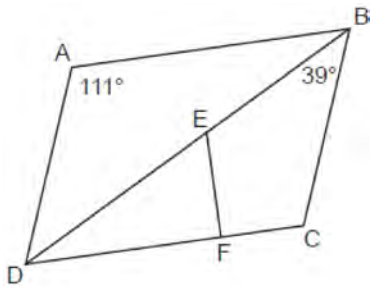
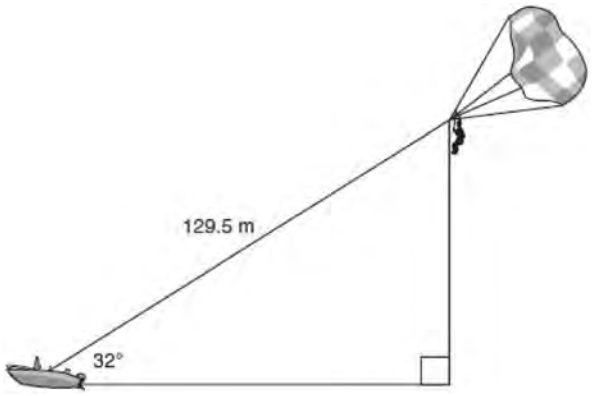
237 In the diagram below of parallelogram $ABCD$, diagonal $\overline{BED}$ and $\overline{EF}$ are drawn, $\overline{EF} \perp \overline{DFC}$, $m\angle DAB = 111°$, and $m\angle DBC = 39°$.



What is $m\angle DEF$?

238 In a right triangle, the acute angles have the relationship $\sin(2x + 4) = \cos(46)$. What is the value of x?

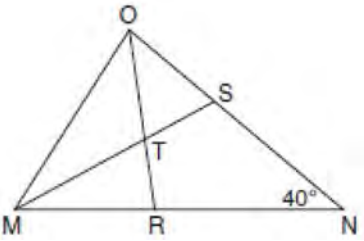
239 A man was parasailing above a lake at an angle of elevation of 32° from a boat, as modeled in the diagram below.



If 129.5 meters of cable connected the boat to the parasail, approximately how many meters above the lake was the man?

240 If the circumference of a standard lacrosse ball is 19.9 cm, what is the volume of this ball, to the *nearest cubic centimeter*?

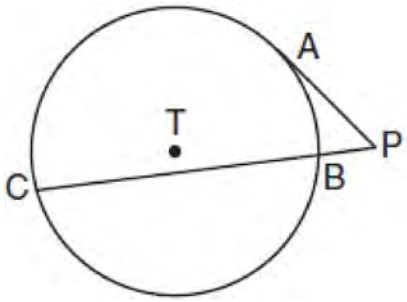
241 In the diagram below of triangle MNO, $\angle M$ and $\angle O$ are bisected by $\overline{MS}$ and $\overline{OR}$, respectively. Segments MS and OR intersect at T, and $m\angle N = 40°$.



If $m\angle TMR = 28°$, the measure of angle OTS is

242 Zach placed the foot of an extension ladder 8 feet from the base of the house and extended the ladder 25 feet to reach the house. To the *nearest degree*, what is the measure of the angle the ladder makes with the ground?

243 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 $\overline{PA}$?

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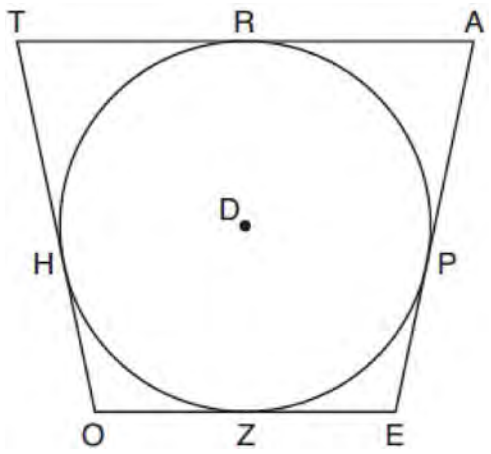
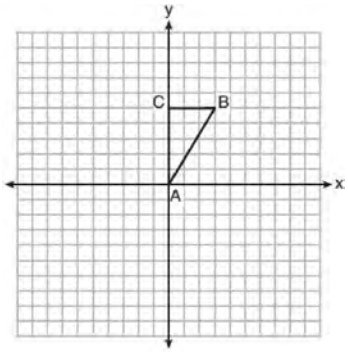
244 In the figure shown below, quadrilateral *TAEO* is circumscribed around circle *D*. The midpoint of $\overline{TA}$ is *R*, and $\overline{HO} \cong \overline{PE}$.



If $AP = 10$ and $EO = 12$, what is the perimeter of quadrilateral *TAEO*?

245 An equation of the line perpendicular to the line whose equation is $4x - 5y = 6$ and passes through the point $(-2, 3)$ is

246 Triangle *ABC*, with vertices at $A(0,0)$, $B(3,5)$, and $C(0,5)$, is graphed on the set of axes shown below.

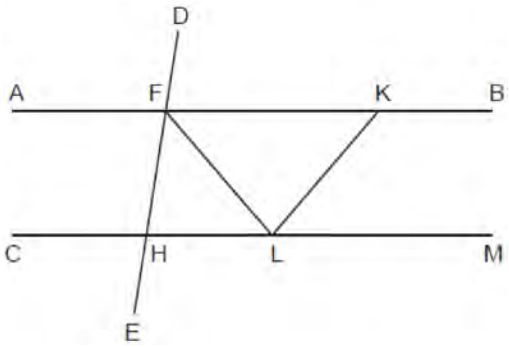


Which figure is formed when $\triangle ABC$ is rotated continuously about $\overline{BC}$?

247 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?

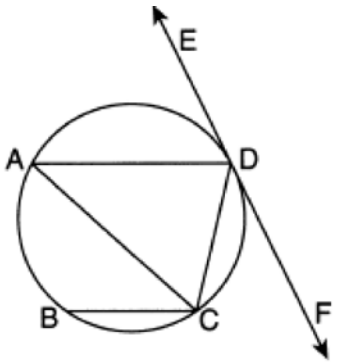
248 A circle is continuously rotated about its diameter. Which three-dimensional object will be formed?

249 In the diagram below, $\overline{AFKB} \parallel \overline{CHLM}$, $\overline{FH} \cong \overline{LH}$, $\overline{FL} \cong \overline{KL}$, and $\overline{LF}$ bisects $\angle HFK$.



Which statement is always true?

250 In the circle below, $\overline{AD}$, $\overline{AC}$, $\overline{BC}$, and $\overline{DC}$ are chords, $\overleftrightarrow{EDF}$ is tangent at point *D*, and $\overline{AD} \parallel \overline{BC}$.



Which statement is always true?

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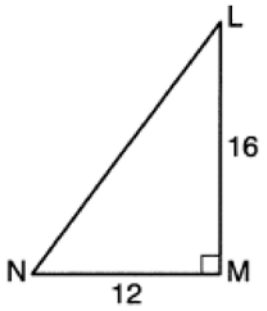
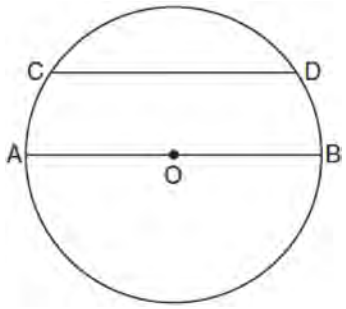
251 In right triangle LMN shown below, $m\angle M = 90°$, $MN = 12$, and $LM = 16$.



The ratio of $\cos N$ is

252 An equation of circle M is $x^2 + y^2 + 6x - 2y + 1 = 0$. What are the coordinates of the center and the length of the radius of circle M?

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



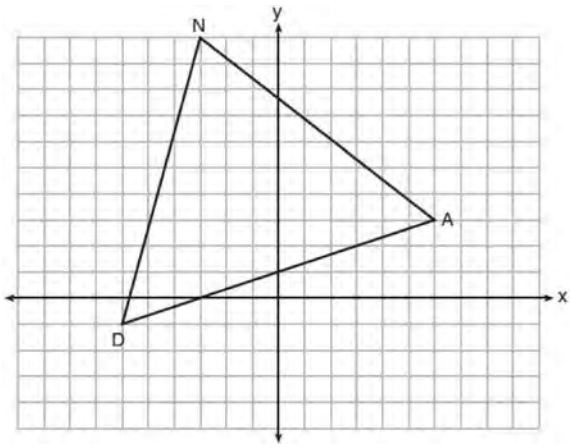
What is $m\overset{\frown}{AC}$?

254 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

255 In right triangle ABC, $m\angle A = 90°$, $m\angle B = 18°$, and $AC = 8$. To the *nearest tenth*, the length of $\overline{BC}$ is

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

257 Triangle DAN is graphed on the set of axes below. The vertices of $\triangle DAN$ have coordinates $D(-6,-1)$, $A(6,3)$, and $N(-3,10)$.



What is the area of $\triangle DAN$?

258 The endpoints of $\overline{AB}$ are $A(-5,3)$ and $B(7,-5)$. Point P is on $\overline{AB}$ such that $AP:PB = 3:1$. What are the coordinates of point P?

259 A gardener wants to buy enough mulch to cover a rectangular garden that is 3 feet by 10 feet. One bag contains 2 cubic feet of mulch and costs $3.66. How much will the minimum number of bags cost to cover the garden with mulch 3 inches deep?

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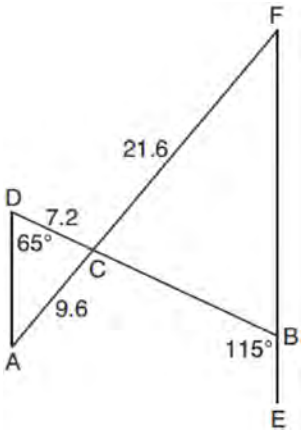
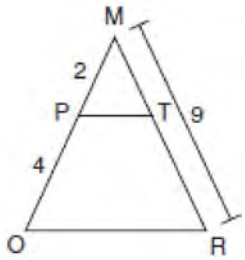
260 In the diagram below, $\overline{AF}$, and $\overline{DB}$ intersect at C, and $\overline{AD}$ and $\overline{FBE}$ are drawn such that m$\angle D = 65°$, m$\angle CBE = 115°$, $DC = 7.2$, $AC = 9.6$, and $FC = 21.6$.



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

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



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

262 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?

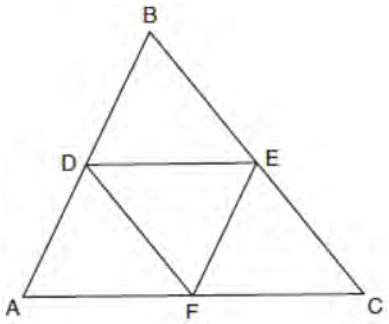
263 Which set of statements would describe a parallelogram that can always be classified as a rhombus?

I. Diagonals are perpendicular bisectors of each other.

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

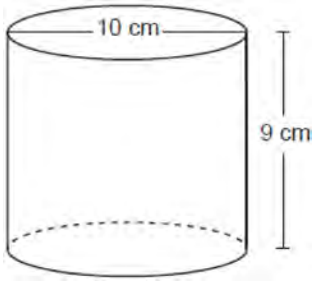
III. Diagonals form four congruent isosceles right triangles.

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



The perimeter of quadrilateral $ADEF$ is equivalent to

265 Darnell models a cup with the cylinder below. He measured the diameter of the cup to be 10 cm and the height to be 9 cm.



If Darnell fills the cup with water to a height of 8 cm, what is the volume of the water in the cup, to the *nearest cubic centimeter*?

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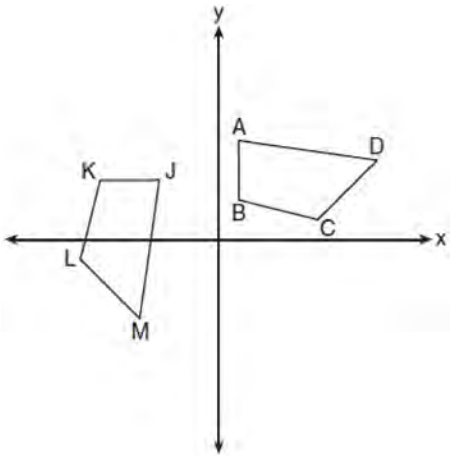
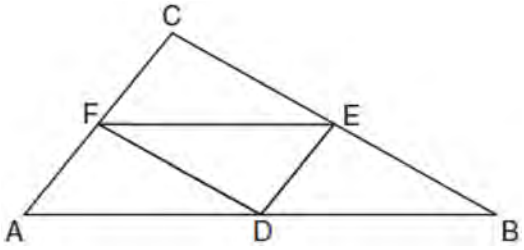
266 The equation of line t is $3x - y = 6$. Line m is the image of line t after a dilation with a scale factor of $\frac{1}{2}$ centered at the origin. What is an equation of the line m?

267 In the diagram below, a sequence of rigid motions maps $ABCD$ onto $JKLM$.



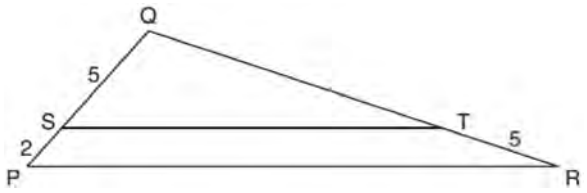
If $m\angle A = 82°$, $m\angle B = 104°$, and $m\angle L = 121°$, the measure of $\angle M$ is

268 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 $\triangle CAB$?

269 In the diagram below of $\triangle PQR$, $\overline{ST}$ is drawn parallel to $\overline{PR}$, $PS = 2$, $SQ = 5$, and $TR = 5$.

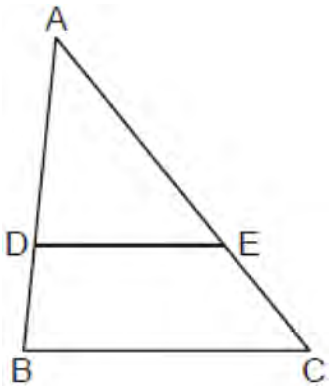


What is the length of $\overline{QR}$?

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

271 Rhombus $STAR$ has vertices $S(-1,2)$, $T(2,3)$, $A(3,0)$, and $R(0,-1)$. What is the perimeter of rhombus $STAR$?

272 In triangle ABC below, D is a point on $\overline{AB}$ and E is a point on $\overline{AC}$, such that $\overline{DE} \parallel \overline{BC}$.



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

Geometry Regents Bimodal Worksheet # 38 Name: _____
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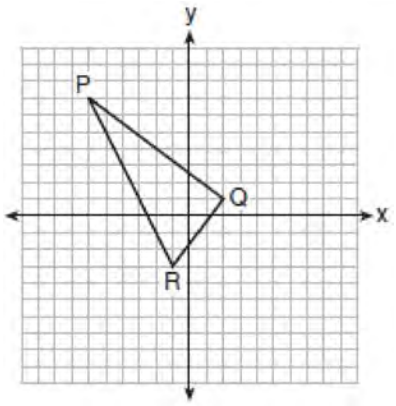
273 A jewelry company makes copper heart pendants. Each heart uses 0.75 in^3 of copper and there is 0.323 pound of copper per cubic inch. If copper costs $3.68 per pound, what is the total cost for 24 copper hearts?

274 A plane intersects a sphere. Which two-dimensional shape is formed by this cross section?

275 In $\triangle ABC$, side $\overline{BC}$ is extended through C to D. If $m\angle A = 30°$ and $m\angle ACD = 110°$, what is the longest side of $\triangle ABC$?

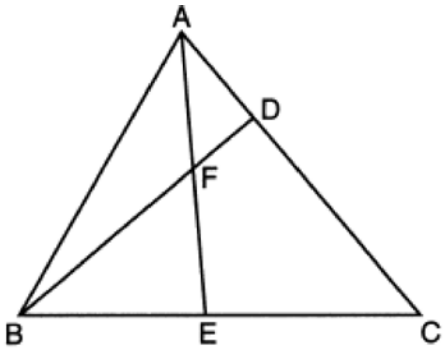
276 Line segment CD is the altitude drawn to hypotenuse $\overline{EF}$ in right triangle ECF. If $EC = 10$ and $EF = 24$, then, to the *nearest tenth*, ED is

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



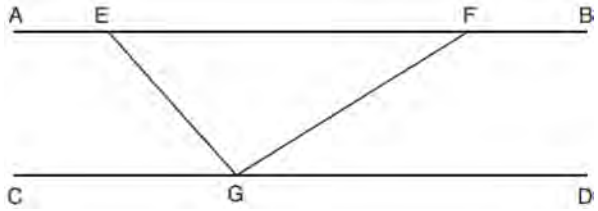
What is the area of $\triangle PQR$?

278 In the diagram of $\triangle ABC$ below, $\overline{AE}$ bisects angle BAC, and altitude $\overline{BD}$ is drawn.



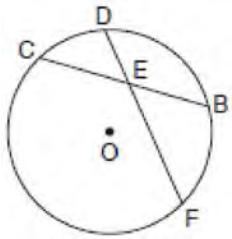
If $m\angle C = 50°$ and $m\angle ABC = 60°$, $m\angle FEB$ is

279 In the diagram below, $\overline{AEFB} \parallel \overline{CGD}$, and $\overline{GE}$ and $\overline{GF}$ are drawn.



If $m\angle EFG = 32°$ and $m\angle AEG = 137°$, what is $m\angle EGF$?

280 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

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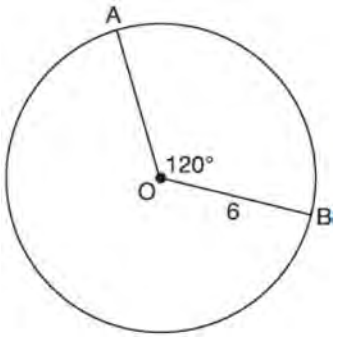
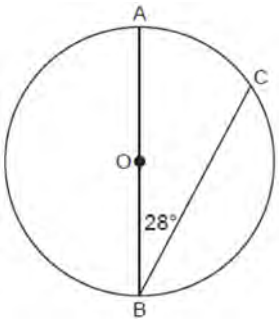
281 The diagram below shows circle O with radii $\overline{OA}$ and $\overline{OB}$. The measure of angle AOB is 120°, and the length of a radius is 6 inches.



Which expression represents the length of arc AB, in inches?

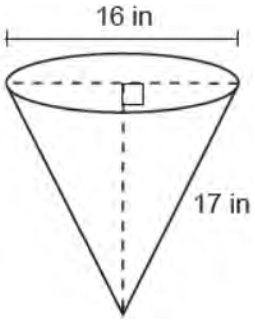
282 In the diagram below of Circle O, diameter $\overline{AOB}$ and chord $\overline{CB}$ are drawn, and $m\angle B = 28°$.



What is $m\overset{\frown}{BC}$?

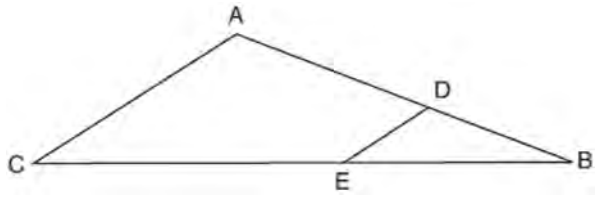
283 A regular pyramid with a square base is made of solid glass. It has a base area of 36 cm^2 and a height of 10 cm. If the density of glass is 2.7 grams per cubic centimeter, the mass of the pyramid, in grams, is

284 In the diagram below, a cone has a diameter of 16 inches and a slant height of 17 inches.



What is the volume of the cone, in cubic inches?

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



If EB is 3 more than DB, $AB = 14$, and $CB = 21$, what is the length of $\overline{AD}$?

286 What is the volume of a right circular cone that has a height of 7.2 centimeters and a radius of 2.5 centimeters, to the *nearest tenth of a cubic centimeter*?

287 Right triangle ACT has $m\angle A = 90°$. Which expression is always equivalent to $\cos T$?

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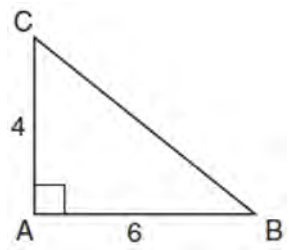
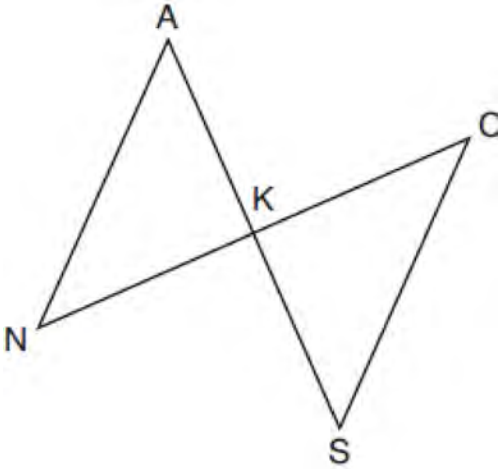
288 In the diagram below, right triangle ABC has legs whose lengths are 4 and 6.



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

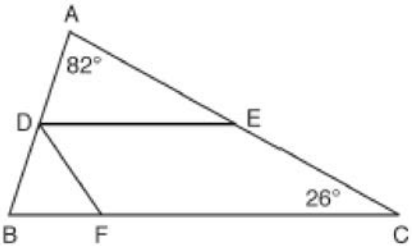
289 An isosceles right triangle whose legs measure 6 is continuously rotated about one of its legs to form a three-dimensional object. The three-dimensional object is a

290 In the diagram below, $\overline{AKS}$, $\overline{NKC}$, $\overline{AN}$, and $\overline{SC}$ are drawn such that $\overline{AN} \cong \overline{SC}$.



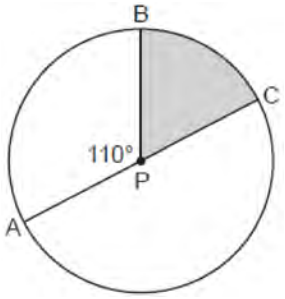
Which additional statement is sufficient to prove $\triangle KAN \cong \triangle KSC$ by AAS?

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



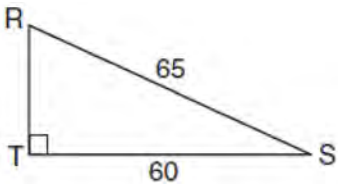
The measure of angle DFB is

292 In circle P below, diameter $\overline{AC}$ and radius $\overline{BP}$ are drawn such that $m\angle APB = 110°$.



If $AC = 12$, what is the area of shaded sector BPC?

293 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*?

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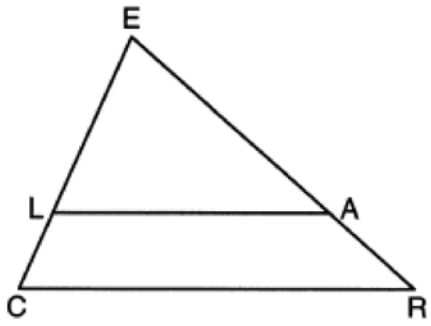
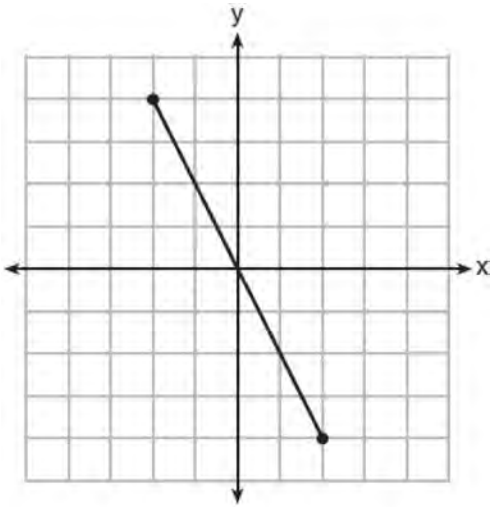
294 In the diagram below of $\triangle CER$, $\overline{LA} \parallel \overline{CR}$.



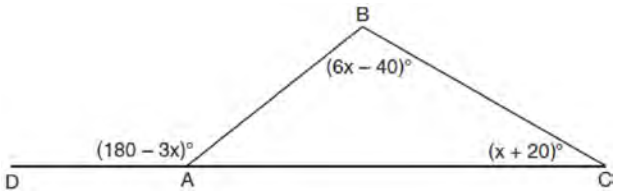
If $CL = 3.5$, $LE = 7.5$, and $EA = 9.5$, what is the length of $\overline{AR}$, to the *nearest tenth*?

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



296 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?

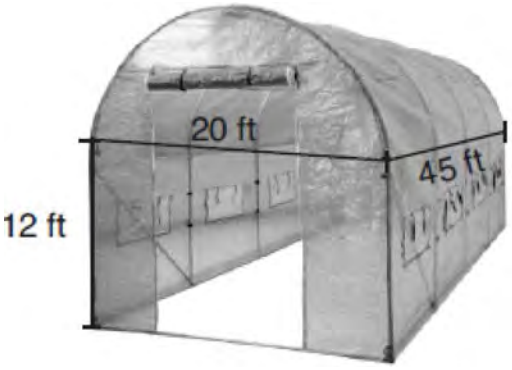
297 In $\triangle ABC$ shown below, side $\overline{AC}$ is extended to point D with $m\angle DAB = (180 - 3x)°$, $m\angle B = (6x - 40)°$, and $m\angle C = (x + 20)°$.



What is $m\angle BAC$?

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

299 The greenhouse pictured below can be modeled as a rectangular prism with a half-cylinder on top. The rectangular prism is 20 feet wide, 12 feet high, and 45 feet long. The half-cylinder has a diameter of 20 feet.



To the *nearest cubic foot*, what is the volume of the greenhouse?

300 The equation of a circle is $x^2 + y^2 + 12x = -27$. What are the coordinates of the center and the length of the radius of the circle?

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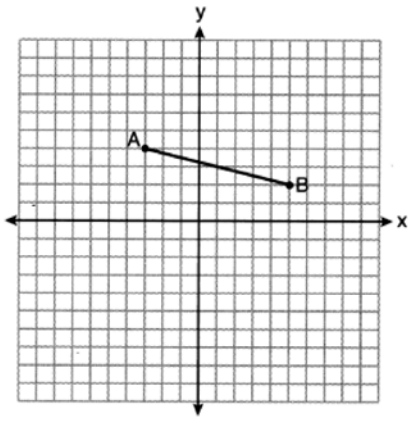
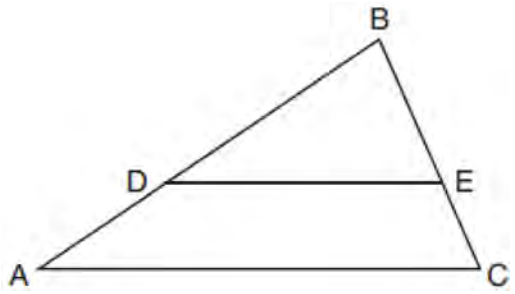
301 On the set of axes below, the endpoints of $\overline{AB}$ have coordinates $A(-3,4)$ and $B(5,2)$.



If $\overline{AB}$ is dilated by a scale factor of 2 centered at $(3,5)$, what are the coordinates of the endpoints of its image, $\overline{A'B'}$?

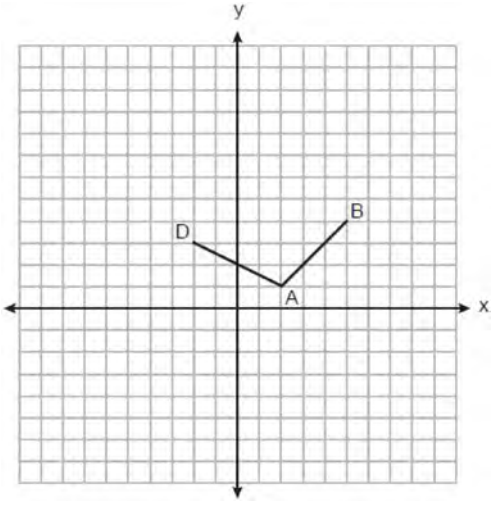
302 In triangle ABC, points D and E are on sides $\overline{AB}$ and $\overline{BC}$, respectively, such that $\overline{DE} \parallel \overline{AC}$, and $AD:DB = 3:5$.



If $DB = 6.3$ and $AC = 9.4$, what is the length of DE, to the *nearest tenth*?

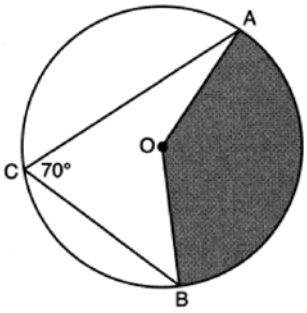
303 The base of a pyramid is a rectangle with a width of 4.6 cm and a length of 9 cm. What is the height, in centimeters, of the pyramid if its volume is 82.8 cm^3?

304 On the set of axes below, the coordinates of three vertices of trapezoid $ABCD$ are $A(2,1)$, $B(5,4)$, and $D(-2,3)$.



Which point could be vertex C?

305 In the diagram below of circle O, $\overline{AC}$ and $\overline{BC}$ are chords, and $m\angle ACB = 70°$.



If $OA = 9$, the area of the shaded sector AOB is

306 The coordinates of the endpoints of directed line segment ABC are $A(-8,7)$ and $C(7,-13)$. If $AB:BC = 3:2$, the coordinates of B are

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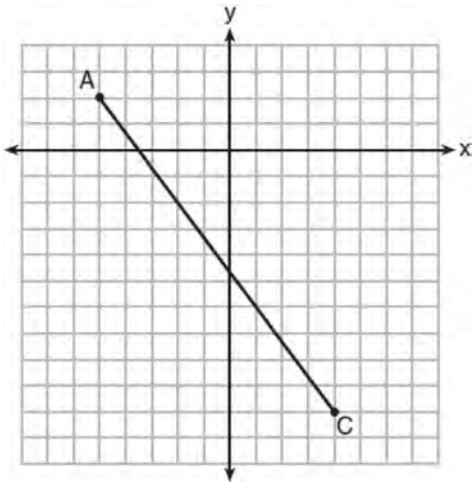
307 The coordinates of the endpoints of $\overline{AB}$ are $A(-8,-2)$ and $B(16,6)$. Point P is on $\overline{AB}$. What are the coordinates of point P, such that $AP:PB$ is 3:5?

308 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?

309 The area of $\triangle TAP$ is 36 cm^2. A second triangle, JOE, is formed by connecting the midpoints of each side of $\triangle TAP$. What is the area of JOE, in square centimeters?

310 A right cylinder is cut perpendicular to its base. The shape of the cross section is a

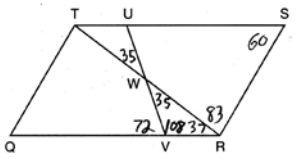
311 What is the image of $(4,3)$ after a reflection over the line $y = 1$?

312 The rectangle drawn below is continuously rotated about side S.

Which three-dimensional figure is formed by this rotation?

Geometry Regents Bimodal Worksheets
Answer Section

1 ANS:
72°



PTS: 2 REF: 011603geo TOP: Interior and Exterior Angles of Polygons

2 ANS:
square

PTS: 2 REF: 062202geo TOP: Cross-Sections of Three-Dimensional Objects

3 ANS:

$x^2 - 2x + y^2 - 8y = 8$

$(x-1)^2 + (y-4)^2 = \left(\frac{10}{2}\right)^2$

$x^2 - 2x + 1 + y^2 - 8y + 16 = 25$

$x^2 - 2x + y^2 - 8y = 8$

PTS: 2 REF: 011920geo TOP: Equations of Circles
KEY: write equation, given center and radius

4 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

5 ANS:
3.5

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

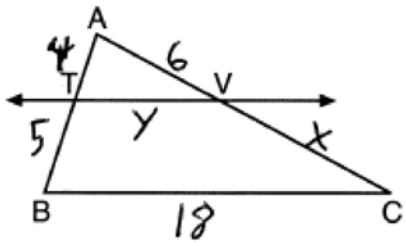
PTS: 2 REF: 061618geo TOP: Density

6 ANS:

$\overline{AD} \cong \overline{CE}$

PTS: 2 REF: 081622geo TOP: Triangle Proofs
KEY: statements

7 ANS:
44.9



$\frac{4}{5} = \frac{6}{x}$ $\frac{4}{9} = \frac{y}{18}$ $5 + 18 + 7.5 + 8 = 38.5$

$x = 7.5$ $y = 8$

PTS: 2 REF: 082222geo TOP: Side Splitter Theorem

8 ANS:
Niagara

Broome: $\frac{200536}{706.82} \approx 284$ Dutchess: $\frac{280150}{801.59} \approx 349$ Niagara: $\frac{219846}{522.95} \approx 420$ Saratoga: $\frac{200635}{811.84} \approx 247$

PTS: 2 REF: 061902geo TOP: Density

9 ANS:
11

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

$x = 15$

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

10 ANS:
630

$44\left(\left(10 \times 3 \times \frac{1}{4}\right) + \left(9 \times 3 \times \frac{1}{4}\right)\right) = 627$

PTS: 2 REF: 082221geo TOP: Volume KEY: compositions

11 ANS:
144

$V = \frac{1}{3} \cdot 6^2 \cdot 12 = 144$

PTS: 2 REF: 011607geo TOP: Volume KEY: pyramids

12 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

13 ANS:
23.8
$5x = 12 \cdot 7$ $16.8 + 7 = 23.8$

$5x = 84$

$x = 16.8$

PTS: 2 REF: 061911geo TOP: Side Splitter Theorem

14 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

15 ANS:
I

PTS: 2 REF: 012022geo TOP: Compositions of Transformations
KEY: grids

16 ANS:
center $(0,6)$ and radius 7.5
$x^2 + y^2 - 12y + 36 = 20.25 + 36$ $\sqrt{56.25} = 7.5$

$x^2 + (y-6)^2 = 56.25$

PTS: 2 REF: 082219geo TOP: Equations of Circles
KEY: completing the square

17 ANS:
40º
$\frac{x}{360} \cdot 3^2\pi = 2\pi$ $180 - 80 = 100$

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

PTS: 2 REF: 011612geo TOP: Sectors

18 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

19 ANS:
56

$\sin x = \frac{10}{12}$

$x \approx 56$

PTS: 2 REF: 061922geo TOP: Using Trigonometry to Find an Angle

20 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
KEY: completing the square

21 ANS:
6.3

$\cos 65 = \frac{x}{15}$

$x \approx 6.3$

PTS: 2 REF: 081924geo TOP: Using Trigonometry to Find a Side

22 ANS:
$6\sqrt{10}$

$h^2 = 30 \cdot 12$

$h^2 = 360$

$h = 6\sqrt{10}$

PTS: 2 REF: 061613geo TOP: Similarity KEY: altitude

23 ANS:
rotation

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

24 ANS:
$\frac{\pi}{5}$

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

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

25 ANS:
230

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

$230 \approx s$

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

26 ANS:
14.3

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

$9x = 46$

$x \approx 5.1$

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

27 ANS:
12

$\frac{1}{2} \times 24 = 12$

PTS: 2 REF: 012009geo TOP: Midsegments

28 ANS:
$(-3, 4)$

$-9 + \frac{1}{3}(9 - -9) = -9 + \frac{1}{3}(18) = -9 + 6 = -3$ $8 + \frac{1}{3}(-4 - 8) = 8 + \frac{1}{3}(-12) = 8 - 4 = 4$

PTS: 2 REF: 081903geo TOP: Directed Line Segments

29 ANS:
12.1

$x^2 = 10.2 \times 14.3$

$x \approx 12.1$

PTS: 2 REF: 012016geo TOP: Similarity KEY: leg

30 ANS:
$\cos A$

PTS: 2 REF: 011922geo TOP: Cofunctions

31 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: Triangles in the Coordinate Plane

32 ANS:
dilation

PTS: 2 REF: 081602geo TOP: Identifying Transformations
KEY: basic

33 ANS:
12

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

$12x = 144$

$x = 12$

PTS: 2 REF: 061621geo TOP: Side Splitter Theorem

34 ANS:
24

Create two congruent triangles by drawing $\overline{BD}$, which has a length of 8. Each triangle has an area of $\frac{1}{2}(8)(3) = 12$.

PTS: 2 REF: 012018geo TOP: Polygons in the Coordinate Plane

35 ANS:
110°

$90 - 35 = 55 \quad 55 \times 2 = 110$

PTS: 2 REF: 012015geo TOP: Properties of Transformations
KEY: graphics

36 ANS:
18.75

$12x = 9^2 \qquad 6.75 + 12 = 18.75$

$12x = 81$

$x = \frac{82}{12} = \frac{27}{4}$

PTS: 2 REF: 062213geo TOP: Similarity KEY: altitude

37 ANS:
15π

$\frac{54}{360} \cdot 10^2 \pi = 15\pi$

PTS: 2 REF: 062224geo TOP: Sectors

38 ANS:
$(-4, 0)$

$-7 + \frac{1}{3}(2 - -7) = -7 + \frac{1}{3}(9) = -7 + 3 = -4 \quad 3 + \frac{1}{3}(-6 - 3) = 3 + \frac{1}{3}(-9) = 3 - 3 = 0$

PTS: 2 REF: 082213geo TOP: Directed Line Segments

39 ANS:

$\frac{1}{3}$

$\frac{1}{3}, \frac{3}{9}, \frac{\sqrt{10}}{\sqrt{90}}$

PTS: 2 REF: 082206geo TOP: Dilations

40 ANS:

6.25

$\frac{x}{15} = \frac{5}{12}$

$x = 6.25$

PTS: 2 REF: 011906geo TOP: Side Splitter Theorem

41 ANS:

trapezoid

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

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

42 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

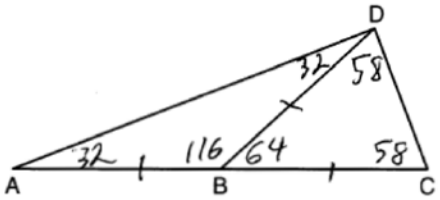
43 ANS:

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

PTS: 2 REF: 081606geo TOP: Cofunctions

44 ANS:

58°



PTS: 2 REF: 081905geo TOP: Exterior Angle Theorem

45 ANS:
6

$\frac{4}{x} = \frac{6}{9}$

$x = 6$

PTS: 2 REF: 061915geo TOP: Similarity KEY: basic

46 ANS:
$y = 2x - 16$

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

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

$-16 = b$

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

47 ANS:
Beth and Carl

PTS: 2 REF: 081619geo TOP: Sectors

48 ANS:
66

$8 \times 3.5 \times 2.25 \times 1.055 = 66.465$

PTS: 2 REF: 012014geo TOP: Density

49 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

50 ANS:
2

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

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

PTS: 2 REF: 061519geo TOP: Surface Area

51 ANS:
twice the volume of cone *B*

$$\frac{\frac{1}{3}\pi(2)^2\left(\frac{1}{2}\right)}{\frac{1}{3}\pi(1)^2(1)} = 2$$

PTS: 2 REF: 012010geo TOP: Volume KEY: cones

52 ANS:
19

$$(8\times 2)+(3\times 2)-\left(\frac{18}{12}\times\frac{21}{12}\right)\approx 19$$

PTS: 2 REF: 081917geo TOP: Compositions of Polygons and Circles
KEY: area

53 ANS:
cone

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

54 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

55 ANS:
44°

$4x+3x+13=90$ $4(11)<3(11)+13$

$7x=77$ $44<46$

$x=11$

PTS: 2 REF: 012021geo TOP: Cofunctions

56 ANS:
17.3

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

PTS: 2 REF: 081608geo TOP: 30-60-90 Triangles

57 ANS:
10

$$r=\sqrt{(7-3)^2+(1--2)^2}=\sqrt{16+9}=5$$

PTS: 2 REF: 061503geo TOP: Circles in the Coordinate Plane

58 ANS:
a cone

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

59 ANS:
45.6
$\frac{1}{3}(4.5)^2(10)(0.676) \approx 45.6$

PTS: 2 REF: 062212geo TOP: Density

60 ANS:
decagon
$\frac{360°}{n} = 36$

$n = 10$

PTS: 2 REF: 082205geo TOP: Mapping a Polygon onto Itself

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

PTS: 2 REF: 081621geo TOP: Line Dilations

62 ANS:
Step 2

PTS: 2 REF: 061603geo TOP: Equations of Circles
KEY: find center and radius | completing the square

63 ANS:
$(x-2)^2 + (y+4)^2 = 16$
The line $x = -2$ will be tangent to the circle at $(-2,-4)$. A segment connecting this point and $(2,-4)$ is a radius of the circle with length 4.

PTS: 2 REF: 012020geo TOP: Equations of Circles
KEY: other

64 ANS:
45°
$180 - 40 - 95 = 45$

PTS: 2 REF: 082201geo TOP: Properties of Transformations
KEY: graphics

65 ANS:
a right cylinder with a radius of 7 inches

PTS: 2 REF: 081911geo TOP: Rotations of Two-Dimensional Objects

66 ANS:
25

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

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

67 ANS:
9

$108\pi = \frac{6^2 \pi h}{3}$

$\frac{324\pi}{36\pi} = h$

$9 = h$

PTS: 2 REF: 012002geo TOP: Volume KEY: cones

68 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

69 ANS:
18 inches
$3 \times 6 = 18$

PTS: 2 REF: 061602geo TOP: Line Dilations

70 ANS:
20

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

PTS: 2 REF: 011619geo TOP: Density

71 ANS:
30

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

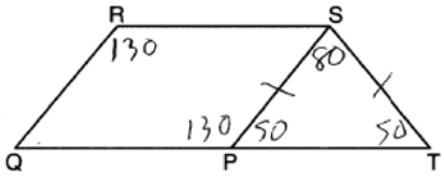
PTS: 2 REF: 061917geo TOP: Special Quadrilaterals

72 ANS:
octagon

$\frac{360°}{45°} = 8$

PTS: 2 REF: 061510geo TOP: Mapping a Polygon onto Itself

73 ANS:
80°



PTS: 2 REF: 061921geo TOP: Interior and Exterior Angles of Polygons

74 ANS:
11

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

$x = 15$

PTS: 2 REF: 011624geo TOP: Similarity KEY: basic

75 ANS:
17.5

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

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

76 ANS:
10°

$\frac{100 - 80}{2} = 10$

PTS: 2 REF: 062219geo TOP: Chords, Secants and Tangents
KEY: secant and tangent drawn from common point, angle

77 ANS:
8

$\frac{10}{x} = \frac{15}{12}$

$x = 8$

PTS: 2 REF: 081918geo TOP: Side Splitter Theorem

78 ANS:
33.75π

$\frac{150}{360} \cdot 9^2 \pi = 33.75\pi$

PTS: 2 REF: 012013geo TOP: Sectors

79 ANS:
32,768.0

$\sqrt{40^2 - \left(\frac{64}{2}\right)^2} = 24 \quad V = \frac{1}{3}(64)^2 \cdot 24 = 32768$

PTS: 2 REF: 081921geo TOP: Volume KEY: pyramids

80 ANS:
1.62

$\frac{4}{3}\pi \times \left(\frac{1.68}{2}\right)^3 \times 0.6523 \approx 1.62$

PTS: 2 REF: 081914geo TOP: Density

81 ANS:
15

$18^2 = 12(x + 12)$

$324 = 12(x + 12)$

$27 = x + 12$

$x = 15$

PTS: 2 REF: 081920geo TOP: Similarity KEY: leg

82 ANS:

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

slope of $\overline{OA} = \frac{4 - 0}{-3 - 0} = -\frac{4}{3} \quad m_{\perp} = \frac{3}{4}$

PTS: 2 REF: 082223geo TOP: Chords, Secants and Tangents
KEY: radius drawn to tangent

83 ANS:
center $(-4, 6)$ and radius 14

$x^2 + 8x + 16 + y^2 - 12y + 36 = 144 + 16 + 36$

$(x + 4)^2 + (y - 6)^2 = 196$

PTS: 2 REF: 061920geo TOP: Equations of Circles
KEY: completing the square

84 ANS:

$\frac{3}{2}$

$\frac{9}{6} = \frac{3}{2}$

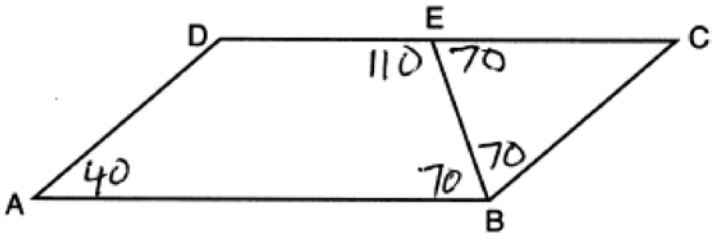
PTS: 2 REF: 061905geo TOP: Line Dilations

85 ANS:
16

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

PTS: 2 REF: 061523geo TOP: Circumference

86 ANS:
110°



PTS: 2 REF: 082215geo TOP: Interior and Exterior Angles of Polygons

87 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
KEY: completing the square

88 ANS:
I, III, and IV, only

PTS: 2 REF: 012019geo TOP: Cross-Sections of Three-Dimensional Objects

89 ANS:
20

PTS: 2 REF: 011918geo TOP: Compositions of Polygons and Circles
KEY: area

90 ANS:
50

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

$A \approx 50°$

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

91 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 $y = 2x - 6$.

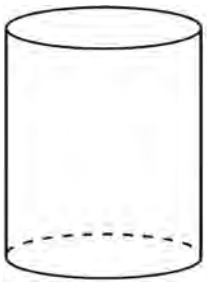
PTS: 2 REF: fall1403geo TOP: Line Dilations

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

PTS: 2 REF: 061507geo TOP: Density

93 ANS:
24
$\frac{12}{6.1x - 6.5} = \frac{5}{1.4x + 3}$ $6.1(5) - 6.5 = 24$
$16.8x + 36 = 30.5x - 32.5$
$68.5 = 13.7x$
$5 = x$

PTS: 2 REF: 062211geo TOP: Similarity KEY: basic

94 ANS:


PTS: 2 REF: 061601geo TOP: Rotations of Two-Dimensional Objects

95 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

96 ANS:
$(-3, 2)$

$M_x = \frac{-5 + -1}{2} = -\frac{6}{2} = -3 \; M_y = \frac{5 + -1}{2} = \frac{4}{2} = 2$

PTS: 2 REF: 081902geo TOP: Quadrilaterals in the Coordinate Plane
KEY: general

97 ANS:

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

$m = \frac{-(-2)}{3} = \frac{2}{3}$

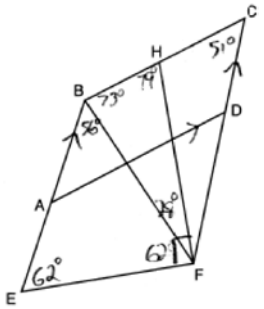
PTS: 2 REF: 061916geo TOP: Parallel and Perpendicular Lines
KEY: write equation of parallel line

98 ANS:
40

$\sqrt{8^2 + 6^2} = 10$ for one side

PTS: 2 REF: 011907geo TOP: Special Quadrilaterals

99 ANS:
79º



$\text{m}\angle CBE = 180 - 51 = 129$

PTS: 2 REF: 062221geo TOP: Interior and Exterior Angles of Polygons

100 ANS:
$(2, 1)$

$-1 + \frac{1}{3}(8 - -1) = -1 + \frac{1}{3}(9) = -1 + 3 = 2 \; -3 + \frac{1}{3}(9 - -3) = -3 + \frac{1}{3}(12) = -3 + 4 = 1$

PTS: 2 REF: 011915geo TOP: Directed Line Segments

101 ANS:
1,384,188

$V = \frac{1}{3} \cdot 197^2 \cdot 107 = 1,384,188$

PTS: 2 REF: 082208geo TOP: Volume KEY: pyramids

102 ANS:
a right triangle

PTS: 2 REF: 081904geo TOP: Centroid, Orthocenter, Incenter and Circumcenter

103 ANS:
$2\sqrt{10}$

$x^2 = 4 \cdot 10$

$x = \sqrt{40}$

$x = 2\sqrt{10}$

PTS: 2 REF: 081610geo TOP: Similarity KEY: leg

104 ANS:
10

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

$f = 10$

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

105 ANS:
100

$2(2x + 8) = 7x - 2$ $AB = 7(6) - 2 = 40$. Since $\overline{EF}$ is a midsegment, $EF = \frac{40}{2} = 20$. Since $\triangle ABC$ is equilateral,

$4x + 16 = 7x - 2$

$18 = 3x$

$6 = x$

$AE = BF = \frac{40}{2} = 20$. $40 + 20 + 20 + 20 = 100$

PTS: 2 REF: 061923geo TOP: Midsegments

106 ANS:
$A(-4, -3)$

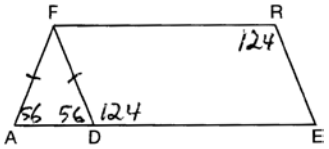
$-7 + \frac{1}{4}(5 - -7) = -7 + \frac{1}{4}(12) = -7 + 3 = -4$ $-5 + \frac{1}{4}(3 - -5) = -5 + \frac{1}{4}(8) = -5 + 2 = -3$

PTS: 2 REF: 012005geo TOP: Directed Line Segments

107 ANS:
$\frac{EC}{EA}$

PTS: 2 REF: 061518geo TOP: Line Dilations

108 ANS:
68°



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

109 ANS:

$k = \frac{1}{2}$

$y = \frac{1}{2}x + 4 \quad \frac{2}{4} = \frac{1}{2}$

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

PTS: 2 REF: 012008geo TOP: Line Dilations

110 ANS:
$(0, 1)$

$-4 + \frac{2}{5}(6 - -4) = -4 + \frac{2}{5}(10) = -4 + 4 = 0 \quad -1 + \frac{2}{5}(4 - -1) = -1 + \frac{2}{5}(5) = -1 + 2 = 1$

PTS: 2 REF: 062222geo TOP: Directed Line Segments

111 ANS:
4.7

$\frac{6.5}{10.5} = \frac{5.2}{x}$

$x = 8.4$

PTS: 2 REF: 012006geo TOP: Trapezoids

112 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

113 ANS:
$(1,-1)$

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

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

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

$1\qquad\quad -1$

PTS: 2 REF: spr1401geo TOP: Directed Line Segments

114 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

115 ANS:
triangle

PTS: 2 REF: 081613geo TOP: Cross-Sections of Three-Dimensional Objects

116 ANS:
$\overline{VA}$

$\angle N$ is the smallest angle in $\triangle NYA$, so side $\overline{AY}$ is the shortest side of $\triangle NYA$. $\angle VYA$ is the smallest angle in $\triangle VYA$, so side $\overline{VA}$ is the shortest side of both triangles.

PTS: 2 REF: 011919geo TOP: Angle Side Relationship

117 ANS:
12.5π

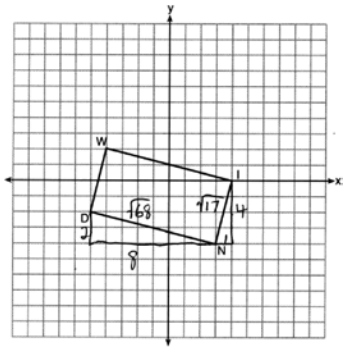
$h=\sqrt{6.5^2-2.5^2}=6,\ V=\frac{1}{3}\pi(2.5)^2 6=12.5\pi$

PTS: 2 REF: 011923geo TOP: Volume KEY: cones

118 ANS:
a right cone with a radius of 15 and a height of 8

PTS: 2 REF: 062208geo TOP: Rotations of Two-Dimensional Objects

119 ANS:
34



$\sqrt{8^2+2^2} \times \sqrt{4^2+1^2} = \sqrt{68} \times \sqrt{17} = \sqrt{4}\sqrt{17} \times \sqrt{17} = 2 \cdot 17 = 34$

PTS: 2 REF: 082214geo TOP: Polygons in the Coordinate Plane

120 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
KEY: completing the square

121 ANS:
a cylinder with a radius of 5 inches and a height of 6 inches

PTS: 2 REF: 011911geo TOP: Rotations of Two-Dimensional Objects

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

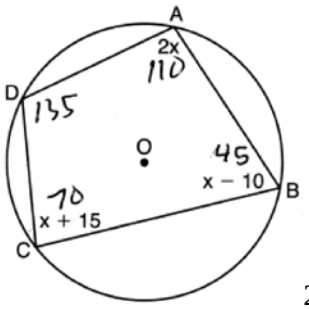
$x = -6 + \frac{1}{6}(6 - -6) = -6 + 2 = -4 \quad y = -2 + \frac{1}{6}(7 - -2) = -2 + \frac{9}{6} = -\frac{1}{2}$

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

123 ANS:
cylinder

PTS: 2 REF: 061903geo TOP: Rotations of Two-Dimensional Objects

124 ANS:
135°



$2x + x + 15 = 180 \quad 180 - 45 = 135$

$3x = 165$

$x = 55$

PTS: 2 REF: 082224geo TOP: Inscribed Quadrilaterals

125 ANS:
6π

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

PTS: 2 REF: 081518geo TOP: Sectors

126 ANS:
555

$\tan 11.87 = \frac{x}{0.5(5280)}$

$x \approx 555$

PTS: 2 REF: 011913geo TOP: Using Trigonometry to Find a Side

127 ANS:

$y + 4 = \frac{6}{5}(x - 1)$

$\left(\frac{-5+7}{2}, \frac{1-9}{2}\right) = (1, -4) \quad m = \frac{1--9}{-5-7} = \frac{10}{-12} = -\frac{5}{6} \quad m_{\perp} = \frac{6}{5}$

PTS: 2 REF: 062220geo TOP: Parallel and Perpendicular Lines
KEY: perpendicular bisector

128 ANS:
$(4, 8)$

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

PTS: 2 REF: 062201geo TOP: Dilations

129 ANS:
54°

$\sin A = \frac{13}{16}$

$A \approx 54°$

PTS: 2 REF: 082207geo TOP: Using Trigonometry to Find an Angle

130 ANS:
A

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

131 ANS:
$\frac{2}{3}$

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

PTS: 2 REF: 081523geo TOP: Dilations

132 ANS:
4

$\frac{18}{4.5} = 4$

PTS: 2 REF: 011901geo TOP: Line Dilations

133 ANS:
cylinder

PTS: 2 REF: 081503geo TOP: Rotations of Two-Dimensional Objects

134 ANS:

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

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

135 ANS:
20

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

$3x - 1 = 2x + 6$

$x = 7$

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

136 ANS:
44°

$180 - (68 \cdot 2)$

PTS: 2 REF: 081624geo TOP: Interior and Exterior Angles of Polygons

137 ANS:
128

$V = \frac{1}{3}(8)^2 \cdot 6 = 128$

PTS: 2 REF: 061906geo TOP: Volume KEY: pyramids

138 ANS:
523.7

$V = \frac{1}{2} \times \frac{4}{3}\pi r^3 = \frac{1}{2} \times \frac{4}{3}\pi \cdot \left(\frac{12.6}{2}\right)^3 \approx 523.7$

PTS: 2 REF: 061910geo TOP: Volume KEY: spheres

139 ANS:
$5\sqrt{10}$

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

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

140 ANS:
20

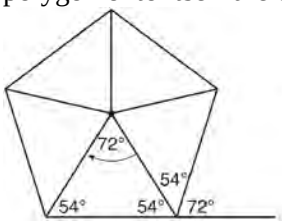
$12^2 = 9 \cdot GM \quad IM^2 = 16 \cdot 25$

$GM = 16 \qquad IM = 20$

PTS: 2 REF: 011910geo TOP: Similarity KEY: leg

141 ANS:
72º

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

142 ANS:
7

$\tan 36 = \frac{x}{8} \quad 5.8 + 1.5 \approx 7$

$x \approx 5.8$

PTS: 2 REF: 081915geo TOP: Using Trigonometry to Find a Side

143 ANS:
$(4,0)$

$-8+\frac{2}{3}(10--8)=-8+\frac{2}{3}(18)=-8+12=4 \quad 4+\frac{2}{3}(-2-4)=4+\frac{2}{3}(-6)=4-4=0$

PTS: 2 REF: 061919geo TOP: Directed Line Segments

144 ANS:
640

$8\times 8\times 9+\frac{1}{3}(8\times 8\times 3)=640$

PTS: 2 REF: 011909geo TOP: Volume KEY: compositions

145 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

146 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

147 ANS:
right

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

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

148 ANS:

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

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

PTS: 2 REF: 011924geo TOP: Line Dilations

149 ANS:

8.5

$2x - 1 = 16$

$x = 8.5$

PTS: 2 REF: 011902geo TOP: Properties of Transformations
KEY: graphics

150 ANS:

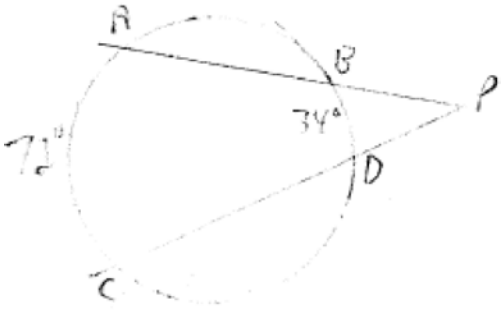
66^o

$180 - (48 + 66) = 180 - 114 = 66$

PTS: 2 REF: 012001geo TOP: Lines and Angles

151 ANS:

19^o



$\frac{72 - 34}{2} = 19$

PTS: 2 REF: 061918geo TOP: Chords, Secants and Tangents
KEY: secants drawn from common point, angle

152 ANS:
center $(4,-3)$ and radius 8

$$x^2 - 8x + y^2 + 6y = 39$$

$$x^2 - 8x + 16 + y^2 + 6y + 9 = 39 + 16 + 9$$

$$(x-4)^2 + (y+3)^2 = 64$$

PTS: 2 REF: 081906geo TOP: Equations of Circles
KEY: completing the square

153 ANS:
54π

$$\left(\frac{360-120}{360}\right)(\pi)\left(9^2\right) = 54\pi$$

PTS: 2 REF: 081912geo TOP: Sectors

154 ANS:
28°

$$\cos C = \frac{15}{17}$$

$$C \approx 28$$

PTS: 2 REF: 012007geo TOP: Using Trigonometry to Find an Angle

155 ANS:
4.9

$$s^2 + s^2 = 7^2$$

$$2s^2 = 49$$

$$s^2 = 24.5$$

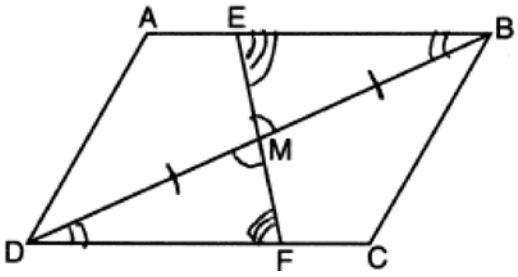
$$s \approx 4.9$$

PTS: 2 REF: 081511geo TOP: Inscribed Quadrilaterals

156 ANS:
reflection over the x-axis

PTS: 2 REF: 061616geo TOP: Identifying Transformations
KEY: graphics

157 ANS:
both ASA and AAS



PTS: 2 REF: 082217geo TOP: Triangle Proofs
KEY: statements

158 ANS:
15

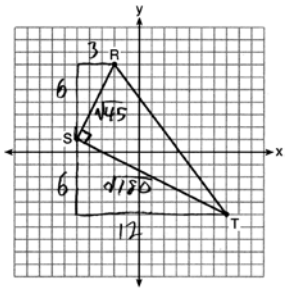
$\frac{1000}{20\pi} \approx 15.9$

PTS: 2 REF: 011623geo TOP: Circumference

159 ANS:
108°

PTS: 2 REF: 081515geo TOP: Inscribed Quadrilaterals

160 ANS:
45



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

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

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

161 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
KEY: completing the square

162 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

163 ANS:
rectangle

PTS: 2 REF: 082211geo TOP: Cross-Sections of Three-Dimensional Objects

164 ANS:
16

$$\frac{2}{4} = \frac{8}{x+2} \quad 14 + 2 = 16$$

$$2x + 4 = 32$$

$$x = 14$$

PTS: 2 REF: 012024geo TOP: Side Splitter Theorem

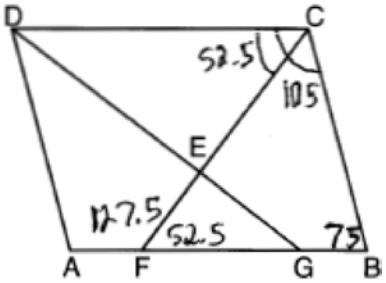
165 ANS:
120°

$$\frac{x}{360}(15)^2\pi = 75\pi$$

$$x = 120$$

PTS: 2 REF: 011914geo TOP: Sectors

166 ANS:
127.5°



PTS: 2 REF: 081907geo TOP: Interior and Exterior Angles of Polygons

167 ANS:

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

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

$1 = -4 + b$

$5 = b$

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

168 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

169 ANS:

$\angle DCB$

PTS: 2 REF: 011621geo TOP: Chords, Secants and Tangents
KEY: inscribed

170 ANS:

24

$\sin 10 = \frac{x}{140}$

$x \approx 24$

PTS: 2 REF: 062217geo TOP: Using Trigonometry to Find a Side

171 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

Geometry Regents Bimodal Worksheets
Answer Section

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

PTS: 2 REF: 011721geo TOP: Sectors

173 ANS:
$y - 8 = -\frac{2}{3}(x - 6)$
$m = \frac{3}{2}$
$m_{\perp} = -\frac{2}{3}$

PTS: 2 REF: 061812geo TOP: Parallel and Perpendicular Lines
KEY: write equation of perpendicular line

174 ANS:
20
$24^2 = 4x \cdot 9x \;\; 5 \cdot 4 = 20$
$576 = 36x^2$
$16 = x^2$
$4 = x$

PTS: 2 REF: 012312geo TOP: Chords, Secants and Tangents
KEY: secant and tangent drawn from common point, length

175 ANS:
$(5, 1)$
$3 + \frac{2}{5}(8 - 3) = 3 + \frac{2}{5}(5) = 3 + 2 = 5 \;\; 5 + \frac{2}{5}(-5 - 5) = 5 + \frac{2}{5}(-10) = 5 - 4 = 1$

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

176 ANS:
rectangle

PTS: 2 REF: 011723geo TOP: Cross-Sections of Three-Dimensional Objects

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

PTS: 2 REF: 011711geo TOP: Volume KEY: compositions

178 ANS:
rectangle

PTS: 2 REF: 011805geo TOP: Cross-Sections of Three-Dimensional Objects

179 ANS:
58

$V = \frac{1}{3}\left(\frac{60}{12}\right)^2\left(\frac{84}{12}\right) \approx 58$

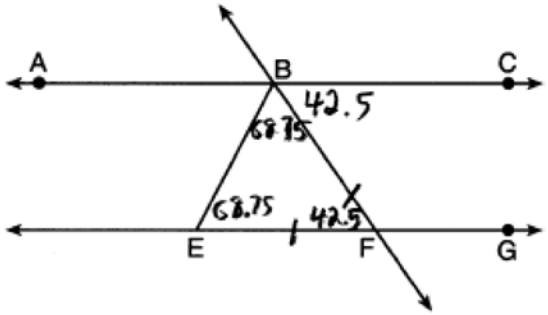
PTS: 2 REF: 081819geo TOP: Volume KEY: pyramids

180 ANS:
$(0, 11)$

$-4 + \frac{2}{5}(6 - -4) = -4 + \frac{2}{5}(10) = -4 + 4 = 0 \quad 5 + \frac{2}{5}(20 - 5) = 5 + \frac{2}{5}(15) = 5 + 6 = 11$

PTS: 2 REF: 061715geo TOP: Directed Line Segments

181 ANS:
68.75°



PTS: 2 REF: 011818geo TOP: Lines and Angles

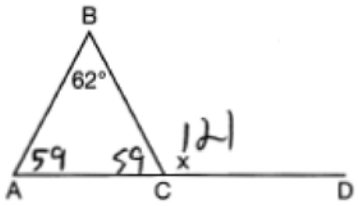
182 ANS:
6

$84 = \frac{1}{3} \cdot s^2 \cdot 7$

$6 = s$

PTS: 2 REF: 061716geo TOP: Volume KEY: pyramids

183 ANS:
121°



PTS: 2 REF: 081711geo TOP: Exterior Angle Theorem

184 ANS:

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

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

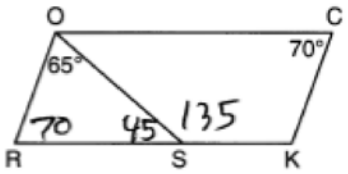
$m_{\perp} = -\frac{2}{3}$ $1 = 4 + b$

$-3 = b$

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

185 ANS:

135º



PTS: 2 REF: 081708geo TOP: Interior and Exterior Angles of Polygons

186 ANS:

4.76

$\tan x = \frac{1}{12}$

$x \approx 4.76$

PTS: 2 REF: 081715geo TOP: Using Trigonometry to Find an Angle

187 ANS:

Illinois, Florida, New York, Pennsylvania

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

188 ANS:

hemisphere

PTS: 2 REF: 011810geo TOP: Rotations of Two-Dimensional Objects

189 ANS:

center $(0, 6)$ and radius 4

$x^2 + y^2 - 12y + 36 = -20 + 36$

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

PTS: 2 REF: 061712geo TOP: Equations of Circles
KEY: completing the square

190 ANS:
19

$\sin 71 = \frac{x}{20}$

$x = 20 \sin 71 \approx 19$

PTS: 2 REF: 061721geo TOP: Using Trigonometry to Find a Side
KEY: without graphics

191 ANS:
84°

$180 - (180 - 42 - 42)$

PTS: 2 REF: 062317geo TOP: Exterior Angle Theorem

192 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

193 ANS:
I, II, and III

PTS: 2 REF: 081822geo TOP: Medians, Altitudes and Bisectors

194 ANS:
47°

$\cos B = \frac{17.6}{26}$

$B \approx 47$

PTS: 2 REF: 061806geo TOP: Using Trigonometry to Find an Angle

195 ANS:
$y = -3x + 6$
The line $y = -3x + 6$ passes through the center of dilation, so the dilated line is not distinct.

PTS: 2 REF: 061824geo TOP: Line Dilations

196 ANS:
6.5

$\frac{30}{360}(5)^2(\pi) \approx 6.5$

PTS: 2 REF: 081818geo TOP: Sectors

197 ANS:
25°

$\cos S = \frac{12.3}{13.6}$

$S \approx 25°$

PTS: 2 REF: 062304geo TOP: Using Trigonometry to Find an Angle

198 ANS:
25

$\frac{24}{40} = \frac{15}{x}$

$24x = 600$

$x = 25$

PTS: 2 REF: 011813geo TOP: Side Splitter Theorem

199 ANS:
the vertical line of symmetry

$v = \pi r^2 h$ (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

200 ANS:

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

$m = \frac{-4}{-6} = \frac{2}{3}$

$m_{\perp} = -\frac{3}{2}$

PTS: 2 REF: 011820geo TOP: Parallel and Perpendicular Lines
KEY: write equation of perpendicular line

201 ANS:

$-\frac{7}{8}$

$m_{\overline{AB}} = \frac{-3-5}{-1-6} = \frac{-8}{-7} = \frac{8}{7}$

PTS: 2 REF: 062315geo TOP: Polygons in the Coordinate Plane

202 ANS:

$y = 2x + 9$

$\left(\frac{-4+0}{2}, \frac{6+4}{2}\right) \rightarrow (-2, 5);\ \frac{6-4}{-4-0} = \frac{2}{-4} = -\frac{1}{2};\ m_{\perp} = 2;\ y - 5 = 2(x+2)$

$y = 2x + 4 + 5$

$y = 2x + 9$

PTS: 2 REF: 062324geo TOP: Parallel and Perpendicular Lines
KEY: perpendicular bisector

203 ANS:

$4\sqrt{3}$

$x^2 = 12(12 - 8)$

$x^2 = 48$

$x = 4\sqrt{3}$

PTS: 2 REF: 011823geo TOP: Similarity KEY: leg

204 ANS:

$x^2 - 10x + y^2 - 4y = -13$

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

$x^2 - 10x + 25 + y^2 - 4y + 4 = 16$

$x^2 - 10x + y^2 - 4y = -13$

PTS: 2 REF: 061820geo TOP: Equations of Circles
KEY: write equation, given graph

205 ANS:

$y = -2x + 2$

$3y = -6x + 3$

$y = -2x + 1$

PTS: 2 REF: 062319geo TOP: Line Dilations

206 ANS:

$(-2, 2)$

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

PTS: 2 REF: 061814geo TOP: Directed Line Segments

207 ANS:

405

$V = \frac{1}{3}\left(\frac{36}{4}\right)^2 \cdot 15 = 405$

PTS: 2 REF: 011822geo TOP: Volume KEY: pyramids

208 ANS:
a translation

PTS: 2 REF: 061803geo TOP: Identifying Transformations
KEY: graphics

209 ANS:
18

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

$x \approx 18$

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

210 ANS:
44º

$\frac{x+72}{2} = 58$

$x + 72 = 116$

$x = 44$

PTS: 2 REF: 061817geo TOP: Chords, Secants and Tangents
KEY: intersecting chords, angle

211 ANS:
23°

$\cos x = \frac{12}{13}$

$x \approx 23$

PTS: 2 REF: 081809ai TOP: Using Trigonometry to Find an Angle

212 ANS:
5264

$V = \pi(8)^2(4-0.5)(7.48) \approx 5264$

PTS: 2 REF: 012320geo TOP: Volume KEY: cylinders

213 ANS:
(2,–3)

$x_0 = \frac{kx_1 - x_2}{k-1} = \frac{\frac{1}{3}(-4) - 0}{\frac{1}{3} - 1} = \frac{\frac{-4}{3}}{\frac{-2}{3}} = 2 \quad y_0 = \frac{ky_1 - y_2}{k-1} = \frac{\frac{1}{3}(0) - -2}{\frac{1}{3} - 1} = \frac{2}{\frac{-2}{3}} = -3$

PTS: 2 REF: 062313geo TOP: Dilations

214 ANS:
$x(x+5) = 36$

PTS: 2 REF: 082320geo TOP: Chords, Secants and Tangents
KEY: secants drawn from common point, length

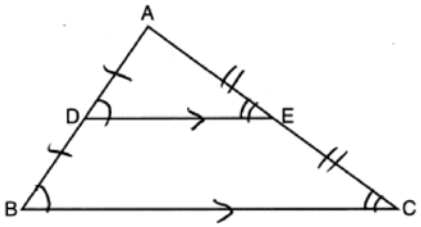
215 ANS:
15
$2x + 7 + 4x - 7 = 90$

$6x = 90$

$x = 15$

PTS: 2 REF: 081824geo TOP: Cofunctions

216 ANS:
I, II, and III



AA from diagram; SSS as the three corresponding sides are proportional; SAS as two corresponding sides are proportional and an angle is equal.

PTS: 2 REF: 012324geo TOP: Similarity Proofs

217 ANS:
a reflection over the line $y = x$

PTS: 2 REF: 011803geo TOP: Identifying Transformations
KEY: graphics

218 ANS:
108
$9 \cdot 3 = 27, 27 \cdot 4 = 108$

PTS: 2 REF: 061805geo TOP: Dilations

219 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

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

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

221 ANS:
28.2

$\sin 16.5 = \frac{8}{x}$

$x \approx 28.2$

PTS: 2 REF: 081806ai TOP: Using Trigonometry to Find a Side

222 ANS:
area of 54 and perimeter of 36

$6 \cdot 3^2 = 54 \quad 12 \cdot 3 = 36$

PTS: 2 REF: 081823geo TOP: Dilations

223 ANS:
II, only

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

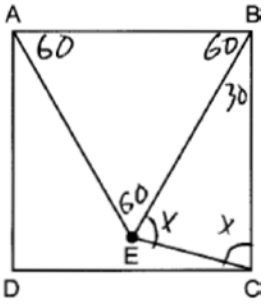
224 ANS:
$\sqrt{72}$

$x^2 = 3 \times 24$

$x = \sqrt{72}$

PTS: 2 REF: 012315geo TOP: Similarity KEY: altitude

225 ANS:
75º



$30 + 2x = 180$

$2x = 150$

$x = 75$

PTS: 2 REF: 082315geo TOP: Interior and Exterior Angles of Polygons

226 ANS:
46º

$\frac{1}{2}(360 - 268) = 46$

PTS: 2 REF: 061704geo TOP: Chords, Secants and Tangents
KEY: inscribed

227 ANS:
8

$$x(x-6) = 4^2$$

$$x^2 - 6x - 16 = 0$$

$$(x-8)(x+2) = 0$$

$$x = 8$$

PTS: 2 REF: 081807geo TOP: Similarity KEY: altitude

228 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

229 ANS:
$-\frac{5}{3}$

The slope of a line in standard form is $-\frac{A}{B}$ so the slope of this line is $\frac{3}{5}$ Perpendicular lines have slope that are the opposite and reciprocal of each other.

PTS: 2 REF: 012313geo TOP: Parallel and Perpendicular Lines
KEY: find slope of perpendicular line

230 ANS:
center $(-1, 8)$ and radius 4

$$x^2 + 2x + 1 + y^2 - 16y + 64 = -49 + 1 + 64$$

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

PTS: 2 REF: 012314geo TOP: Equations of Circles
KEY: completing the square

231 ANS:
32.8

$$6 + 6\sqrt{3} + 6 + 6\sqrt{3} \approx 32.8$$

PTS: 2 REF: 011709geo TOP: 30-60-90 Triangles

232 ANS:
1808

$$2.5 \times 1.25 \times (27 \times 12) + \frac{1}{2}\pi(1.25)^2(27 \times 12) \approx 1808$$

PTS: 2 REF: 061723geo TOP: Volume KEY: compositions

233 ANS:
$\triangle GRS$ is not similar to $\triangle ART$.

$\frac{36}{45} \neq \frac{15}{18}$

$\frac{4}{5} \neq \frac{5}{6}$

PTS: 2 REF: 081709geo STA: G.G.44 TOP: Similarity Proofs

234 ANS:
triangle

PTS: 2 REF: 062301geo TOP: Cross-Sections of Three-Dimensional Objects

235 ANS:
8.25

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

$4.2x = 34.65$

$x = 8.25$

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

236 ANS:
4.0

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

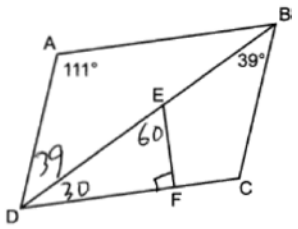
$3.5x = 18 - x$

$4.5x = 18$

$x = 4$

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

237 ANS:
60º



PTS: 2 REF: 062306geo TOP: Interior and Exterior Angles of Polygons

238 ANS:
20

$2x + 4 + 46 = 90$

$2x = 40$

$x = 20$

PTS: 2 REF: 061808geo TOP: Cofunctions

239 ANS:
68.6

$\sin 32 = \frac{O}{129.5}$

$O \approx 68.6$

PTS: 2 REF: 011804geo TOP: Using Trigonometry to Find a Side

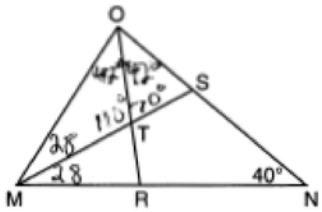
240 ANS:
133

$19.9 = \pi d \quad \frac{4}{3}\pi\left(\frac{19.9}{2\pi}\right)^3 \approx 133$

$\frac{19.9}{\pi} = d$

PTS: 2 REF: 012310geo TOP: Volume KEY: spheres

241 ANS:
70º



PTS: 2 REF: 061717geo TOP: Interior and Exterior Angles of Triangles

242 ANS:
71

$\cos x = \frac{8}{25}$

$x \approx 71$

PTS: 2 REF: 082303geo TOP: Using Trigonometry to Find an Angle

243 ANS:

$3\sqrt{6}$

$x^2 = 3 \cdot 18$

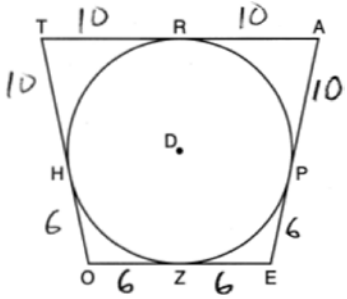
$x = \sqrt{3 \cdot 3 \cdot 6}$

$x = 3\sqrt{6}$

PTS: 2 REF: 081712geo TOP: Chords, Secants and Tangents
KEY: secant and tangent drawn from common point, length

244 ANS:

64



PTS: 2 REF: 081814geo TOP: Chords, Secants and Tangents
KEY: tangents drawn from common point, length

245 ANS:

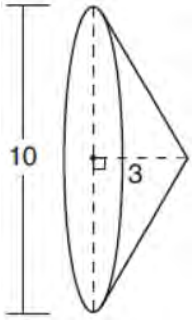
$y - 3 = -\frac{5}{4}(x + 2)$

$m = \frac{-4}{-5} = \frac{4}{5}$

$m_{\perp} = -\frac{5}{4}$

PTS: 2 REF: 082308geo TOP: Parallel and Perpendicular Lines
KEY: write equation of perpendicular line

246 ANS:



PTS: 2 REF: 061816geo TOP: Rotations of Two-Dimensional Objects

247 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
KEY: completing the square

248 ANS:

sphere

PTS: 2 REF: 012302geo TOP: Rotations of Two-Dimensional Objects

249 ANS:

$\text{m}\angle DFK = \text{m}\angle KLF$

PTS: 2 REF: 062318geo TOP: Lines and Angles

250 ANS:

$\angle CDF \cong \angle ACB$

Since $\overline{AD} \parallel \overline{BC}$, $\overset{\frown}{AB} \cong \overset{\frown}{CD}$. $\text{m}\angle ACB = \frac{1}{2}\text{m}\overset{\frown}{AB}$

$\text{m}\angle CDF = \frac{1}{2}\text{m}\overset{\frown}{CD}$

PTS: 2 REF: 012323geo TOP: Chords, Secants and Tangents
KEY: chords and tangents

251 ANS:

$\frac{12}{20}$

$\sin N = \frac{\text{opposite}}{\text{hypotenuse}} = \frac{12}{20}$

PTS: 2 REF: 012307geo TOP: Trigonometric Ratios

252 ANS:

center $(-3,1)$ and radius 3

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

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

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

PTS: 2 REF: 062309geo TOP: Equations of Circles
KEY: completing the square

253 ANS:
25

Parallel chords intercept congruent arcs. $\frac{180-130}{2}=25$

PTS: 2 REF: 081704geo TOP: Chords, Secants and Tangents
KEY: parallel lines

254 ANS:
$\frac{4\pi}{3}$

$\frac{\frac{512\pi}{3}}{\left(\frac{32}{2}\right)^2\pi}\cdot 2\pi=\frac{4\pi}{3}$

PTS: 2 REF: 081723geo TOP: Sectors

255 ANS:
25.9

$\sin 18=\frac{8}{x}$

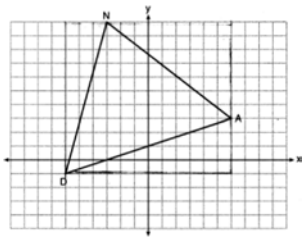
$x\approx 25.9$

PTS: 2 REF: 062316geo TOP: Using Trigonometry to Find a Side

256 ANS:
$\sin A$

PTS: 2 REF: 061703geo TOP: Cofunctions

257 ANS:
60



$(12\cdot 11)-\left(\frac{1}{2}(12\cdot 4)+\frac{1}{2}(7\cdot 9)+\frac{1}{2}(11\cdot 3)\right)=60$

PTS: 2 REF: 061815geo TOP: Polygons in the Coordinate Plane

258 ANS:
(4, –3)

$-5+\frac{3}{4}(7--5)=-5+\frac{3}{4}(12)=-5+9=4\quad 3+\frac{3}{4}(-5-3)=3+\frac{3}{4}(-8)=3-6=-3$

PTS: 2 REF: 082302geo TOP: Directed Line Segments

259 ANS:
$14.64

$3 \times 10 \times \frac{3}{12} = 7.5 \text{ ft}^3 \quad \frac{7.5}{2} = 3.75 \quad 4 \times 3.66 = 14.64$

PTS: 2 REF: 062311geo TOP: Volume KEY: prisms

260 ANS:
16.2

$\triangle CFB \sim \triangle CAD \quad \frac{CB}{CF} = \frac{CD}{CA}$

$\frac{x}{21.6} = \frac{7.2}{9.6}$

$x = 16.2$

PTS: 2 REF: 061804geo TOP: Similarity KEY: basic

261 ANS:
6

$\frac{2}{4} = \frac{9-x}{x}$

$36 - 4x = 2x$

$x = 6$

PTS: 2 REF: 061705geo TOP: Side Splitter Theorem

262 ANS:
center $(3,-1)$ and radius 4

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

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

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

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

263 ANS:
I, II, and III

PTS: 2 REF: 061711geo TOP: Special Quadrilaterals

264 ANS:
$AB + AC$

PTS: 2 REF: 011704geo TOP: Midsegments

265 ANS:
628

$V = \pi r^2 h = \pi \cdot 5^2 \cdot 8 \approx 200\pi$

PTS: 2 REF: 082304geo TOP: Volume KEY: cylinders

266 ANS:
$y = 3x - 3$

Another equation of line t is $y = 3x - 6$. $-6 \bullet \frac{1}{2} = -3$

PTS: 2 REF: 012319geo TOP: Line Dilations

267 ANS:
53°
$360 - (82 + 104 + 121) = 53$

PTS: 2 REF: 011801geo TOP: Properties of Transformations
KEY: graph

268 ANS:
1:4

PTS: 2 REF: 081716geo TOP: Midsegments

269 ANS:
$17\frac{1}{2}$

$\frac{5}{7} = \frac{x}{x+5}$ $12\frac{1}{2} + 5 = 17\frac{1}{2}$

$5x + 25 = 7x$

$2x = 25$

$x = 12\frac{1}{2}$

PTS: 2 REF: 061821geo TOP: Side Splitter Theorem

270 ANS:
3.3

$\sin 32 = \frac{x}{6.2}$

$x \approx 3.3$

PTS: 2 REF: 081719geo TOP: Using Trigonometry to Find a Side

271 ANS:
$4\sqrt{10}$

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

PTS: 2 REF: 081808geo TOP: Polygons in the Coordinate Plane

272 ANS:
25

$\frac{x}{10} = \frac{12}{8}$ $15 + 10 = 25$

$x = 15$

PTS: 2 REF: 082314geo TOP: Side Splitter Theorem

273 ANS:
$21.40

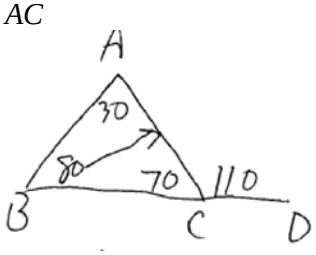
$24 \text{ ht}\left(\frac{0.75 \text{ in}^3}{\text{ht}}\right)\left(\frac{0.323 \text{ lb}}{1 \text{ in}^3}\right)\left(\frac{\$3.68}{\text{lb}}\right) \approx \$21.40$

PTS: 2 REF: 012306geo TOP: Density

274 ANS:
circle

PTS: 2 REF: 082301geo TOP: Cross-Sections of Three-Dimensional Objects

275 ANS:
$\overline{AC}$



PTS: 2 REF: 082310geo TOP: Angle Side Relationship

276 ANS:
4.2

$24x = 10^2$

$24x = 100$

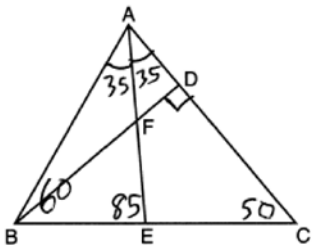
$x \approx 4.2$

PTS: 2 REF: 061823geo TOP: Similarity KEY: leg

277 ANS:
25

PTS: 2 REF: 061702geo TOP: Polygons in the Coordinate Plane

278 ANS:
85º



PTS: 2 REF: 012305geo TOP: Interior and Exterior Angles of Triangles

279 ANS:
105º

PTS: 2 REF: 081801geo TOP: Lines and Angles

280 ANS:
9

$6 \cdot 6 = x(x-5)$

$36 = x^2 - 5x$

$0 = x^2 - 5x - 36$

$0 = (x-9)(x+4)$

$x = 9$

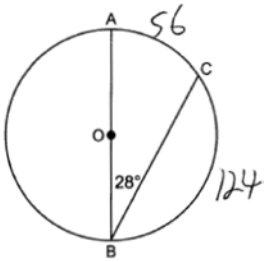
PTS: 2 REF: 061708geo TOP: Chords, Secants and Tangents
KEY: intersecting chords, length

281 ANS:
$\frac{1}{3}(12\pi)$

$C = 12\pi \quad \frac{120}{360}(12\pi) = \frac{1}{3}(12\pi)$

PTS: 2 REF: 061822geo TOP: Arc Length KEY: arc length

282 ANS:
124º



PTS: 2 REF: 062305geo TOP: Chords, Secants and Tangents
KEY: inscribed

283 ANS:
324
$\frac{1}{3}(36)(10)(2.7) = 324$

PTS: 2 REF: 082312geo TOP: Density
284 ANS:
320π
$r = 8$, forming an 8-15-17 triple. $V = \frac{1}{3}\pi(8)^2 15 = 320\pi$

PTS: 2 REF: 082318geo TOP: Volume KEY: cones
285 ANS:
8
$\frac{x}{x+3} = \frac{14}{21}$ $14 - 6 = 8$

$21x = 14x + 42$

$7x = 42$

$x = 6$

PTS: 2 REF: 081812geo TOP: Side Splitter Theorem
286 ANS:
47.1
$V = \frac{1}{3}\pi \cdot (2.5)^2 \cdot 7.2 \cong 47.1$

PTS: 2 REF: 062303geo TOP: Volume KEY: cones
287 ANS:
$\sin C$

PTS: 2 REF: 082311geo TOP: Cofunctions
288 ANS:
32π
$V = \frac{1}{3}\pi(4)^2(6) = 32\pi$

PTS: 2 REF: 061718geo TOP: Rotations of Two-Dimensional Objects
289 ANS:
cone with a diameter of 12

PTS: 2 REF: 081803geo TOP: Rotations of Two-Dimensional Objects
290 ANS:
$\overline{AN} \parallel \overline{SC}$

PTS: 2 REF: 081810geo TOP: Triangle Proofs
KEY: statements

291 ANS:
54°

$\angle B = 180 - (82 + 26) = 72$; $\angle DEC = 180 - 26 = 154$; $\angle EDB = 360 - (154 + 26 + 72) = 108$; $\angle BDF = \frac{108}{2} = 54$;
$\angle DFB = 180 - (54 + 72) = 54$

PTS: 2 REF: 061710geo TOP: Interior and Exterior Angles of Triangles

292 ANS:
7π

$\frac{70}{360} \cdot 6^2 \pi = 7\pi$

PTS: 2 REF: 082309geo TOP: Sectors

293 ANS:
23º

$\cos S = \frac{60}{65}$

$S \approx 23$

PTS: 2 REF: 061713geo TOP: Using Trigonometry to Find an Angle

294 ANS:
4.4

$\frac{7.5}{3.5} = \frac{9.5}{x}$

$x \approx 4.4$

PTS: 2 REF: 012303geo TOP: Side Splitter Theorem

295 ANS:
$2y - x = 0$

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

296 ANS:
15

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

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

$h = 15$

PTS: 2 REF: 011807geo TOP: Volume KEY: cones

297 ANS:
60º
$6x - 40 + x + 20 = 180 - 3x \quad m\angle BAC = 180 - (80 + 40) = 60$

$10x = 200$

$x = 20$

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

298 ANS:
25
$40 - x + 3x = 90$

$2x = 50$

$x = 25$

PTS: 2 REF: 081721geo TOP: Cofunctions

299 ANS:
17,869
$20 \cdot 12 \cdot 45 + \frac{1}{2}\pi(10)^2(45) \approx 17869$

PTS: 2 REF: 061807geo TOP: Volume KEY: compositions

300 ANS:
center $(-6, 0)$ and radius 3
$x^2 + 12x + 36 + y^2 = -27 + 36$

$(x + 6)^2 + y^2 = 9$

PTS: 2 REF: 082313geo TOP: Equations of Circles
KEY: completing the square

301 ANS:
$A'(-9, 3)$ and $B'(7, -1)$
A: $(-3 - 3, 4 - 5) \rightarrow (-6, -1) \rightarrow (-12, -2) \rightarrow (-12 + 3, -2 + 5)$

B: $(5 - 3, 2 - 5) \rightarrow (2, -3) \rightarrow (4, -6) \rightarrow (4 + 3, -6 + 5)$

PTS: 2 REF: 012322geo TOP: Line Dilations

302 ANS:
5.9
$\frac{x}{6.3} = \frac{3}{5} \quad \frac{y}{9.4} = \frac{6.3}{6.3 + 3.78}$

$x = 3.78 \quad y \approx 5.9$

PTS: 2 REF: 081816geo TOP: Side Splitter Theorem

303 ANS:
6

$82.8 = \frac{1}{3}(4.6)(9)h$

$h = 6$

PTS: 2 REF: 061810geo TOP: Volume KEY: pyramids

304 ANS:
$(-3, 8)$

$m_{\overline{AD}} = \frac{3-1}{-2-2} = \frac{2}{-4} = -\frac{1}{2}$ A pair of opposite sides is parallel.

$m_{\overline{BC}} = \frac{8-4}{-3-5} = \frac{4}{-8} = -\frac{1}{2}$

PTS: 2 REF: 082321geo TOP: Quadrilaterals in the Coordinate Plane

305 ANS:
31.5π

$\frac{140}{360} \cdot 9^2 \pi = 31.5\pi$

PTS: 2 REF: 012317geo TOP: Sectors

306 ANS:
$(1, -5)$

$-8 + \frac{3}{5}(7 - -8) = -8 + 9 = 1$ $7 + \frac{3}{5}(-13 - 7) = 7 - 12 = -5$

PTS: 2 REF: 081815geo TOP: Directed Line Segments

307 ANS:
$(1, 1)$

$-8 + \frac{3}{8}(16 - -8) = -8 + \frac{3}{8}(24) = -8 + 9 = 1$ $-2 + \frac{3}{8}(6 - -2) = -2 + \frac{3}{8}(8) = -2 + 3 = 1$

PTS: 2 REF: 081717geo TOP: Directed Line Segments

308 ANS:
$(-2, -2)$

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

PTS: 2 REF: 011806geo TOP: Directed Line Segments

309 ANS:
9

$\frac{36}{4} = 9$

PTS: 2 REF: 012321geo TOP: Midsegments

310 ANS:
rectangle

PTS: 2 REF: 081805geo TOP: Cross-Sections of Three-Dimensional Objects

311 ANS:
$(4, -1)$
$3 - 1 = 2$
$1 - 2 = -1$

PTS: 2 REF: 082317geo TOP: Reflections

312 ANS:
cylinder

PTS: 2 REF: 082307geo TOP: Rotations of Two-Dimensional Objects