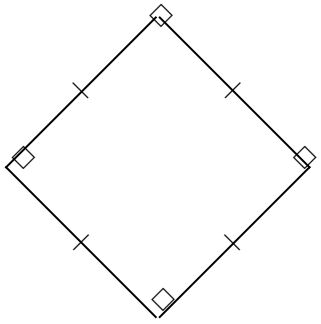
Geometry Semester 2 Review 2013

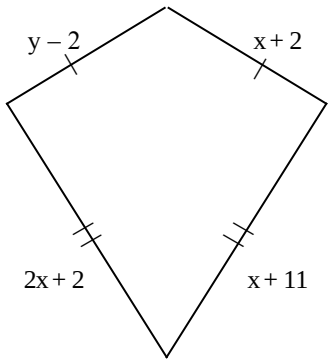
QUADRILATERALS:
Classifying Quadrilaterals
Properties of Parallelograms
Proving that a Quadrilateral is a Parallelogram
Special Parallelograms
Trapezoids & Kites
Placing Figures on a Coordinate Plane

____ 1. Judging by appearance, classify the figure in as many ways as possible.



a. rectangle, square, quadrilateral, parallelogram, rhombus
b. rectangle, square, parallelogram
c. rhombus, trapezoid, quadrilateral, square
d. square, rectangle, quadrilateral

____ 2. Find the values of the variables and the lengths of the sides of this kite.

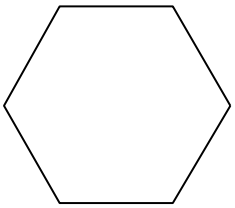


a. $x = 9, y = 13$; 7, 15
b. $x = 13, y = 9$; 7, 15
c. $x = 9, y = 13$; 11, 20
d. $x = 13, y = 9$; 11, 11

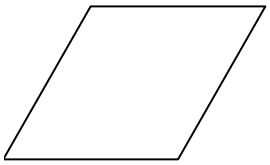
____ 3. Which statement is true?
a. All quadrilaterals are rectangles.
b. All quadrilaterals are squares.
c. All rectangles are quadrilaterals.
d. All quadrilaterals are parallelograms.

____ 4. Judging by appearances, which figure is a trapezoid?

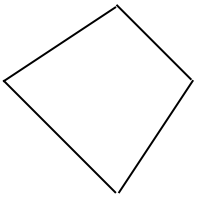
a.



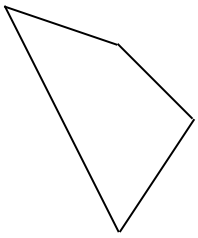
c.



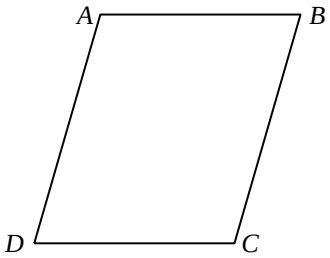
b.



d.

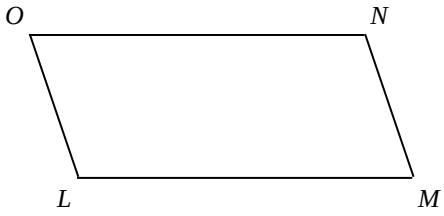


____ 5. *ABCD* is a parallelogram. If $m\angle CDA = 66$, then $m\angle BCD =$ ____?____. The diagram is not to scale.



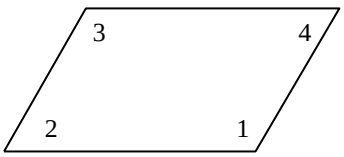
a. 66 b. 124 c. 114 d. 132

____ 6. *LMNO* is a parallelogram. If $NM = x + 15$ and $OL = 3x + 5$ find the value of x and then find NM and OL.



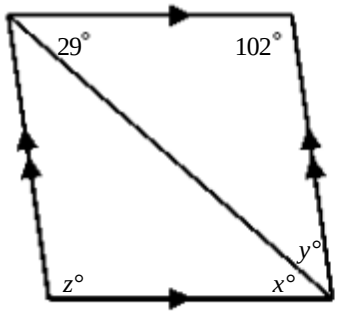
a. $x = 7$, $NM = 20$, $OL = 22$
b. $x = 5$, $NM = 20$, $OL = 20$
c. $x = 7$, $NM = 22$, $OL = 22$
d. $x = 5$, $NM = 22$, $OL = 20$

____ 7. For the parallelogram, if $m\angle 2 = 5x - 28$ and $m\angle 4 = 3x - 10$, find $m\angle 3$. The diagram is not to scale.



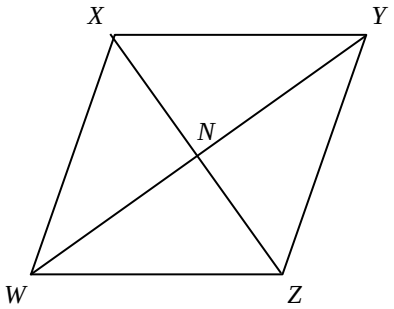
a. 9 b. 17 c. 173 d. 163

____ 8. Find the values of the variables in the parallelogram. The diagram is not to scale.



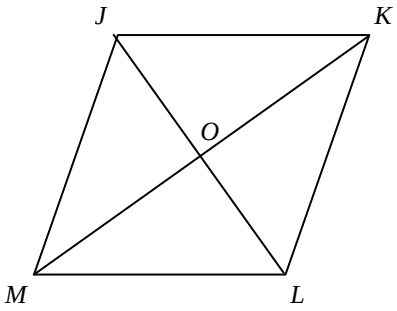
a. $x = 49, y = 29, z = 102$
b. $x = 29, y = 49, z = 131$
c. $x = 49, y = 49, z = 131$
d. $x = 29, y = 49, z = 102$

____ 9. *WXYZ* is a parallelogram. Name an angle congruent to $\angle WZY$.



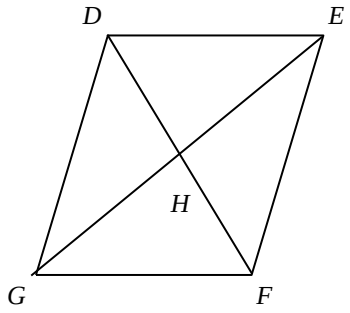
a. $\angle ZXY$ b. $\angle XWZ$ c. $\angle ZXW$ d. $\angle WXY$

____ 10. In the parallelogram, $m\angle KLO = 68$ and $m\angle MLO = 61$. Find $\angle KJM$. The diagram is not to scale.



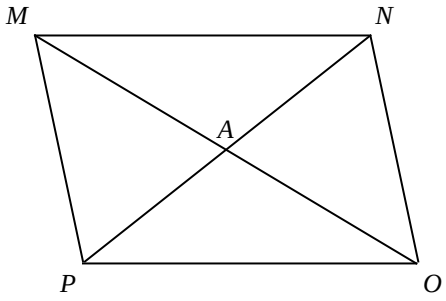
a. 119 b. 61 c. 129 d. 68

____ 11. In parallelogram *DEFG*, $DH = x + 3$, $HF = 3y$, $GH = 4x - 5$, and $HE = 2y + 3$. Find the values of x and y. The diagram is not to scale.



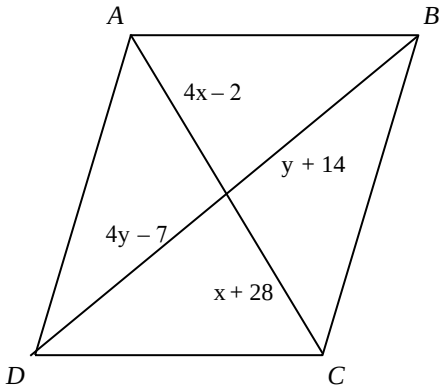
a. $x = 6, y = 3$ b. $x = 2, y = 3$ c. $x = 3, y = 2$ d. $x = 3, y = 6$

____ 12. Find *AM* in the parallelogram if *PN* =9 and *AO* = 4. The diagram is not to scale.



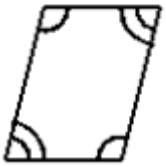
a. 8 b. 4 c. 9 d. 4.5

____ 13. Find values of x and y for which *ABCD* must be a parallelogram. The diagram is not to scale.



a. $x = 10, y = 38$ b. $x = 10, y = 21$ c. $x = 10, y = 7$ d. $x = 7, y = 10$

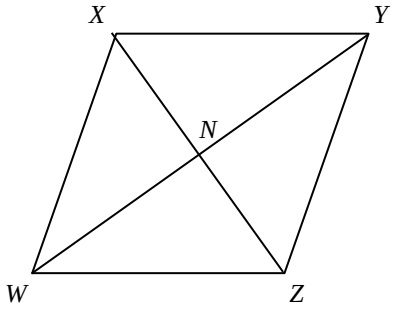
____ 14. Based on the information in the diagram, can you prove that the figure is a parallelogram? Explain.



a. Yes; opposite sides are congruent.
b. Yes; opposite angles are congruent.
c. No; you cannot prove that the quadrilateral is a parallelogram.
d. Yes; two opposite sides are both parallel and congruent.

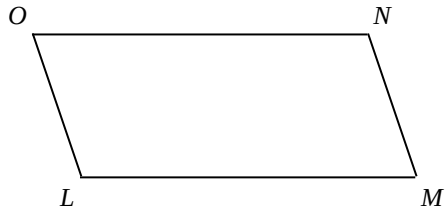
____ 15. Based on the information given, can you determine that the quadrilateral must be a parallelogram? Explain.

Given: $\overline{XY} \cong \overline{WZ}$ and $\overline{XW} \cong \overline{YZ}$



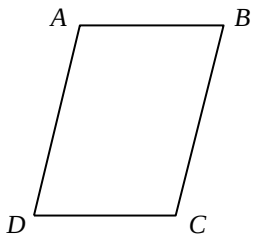
a. No; you cannot determine that the quadrilateral is a parallelogram.
b. Yes; two opposite sides are both parallel and congruent.
c. Yes; opposite sides are congruent.
d. Yes; diagonals of a parallelogram bisect each other.

____ 16. If $ON = 5x - 5$, $LM = 4x + 4$, $NM = x - 9$, and $OL = 2y - 5$, find the values of x and y for which $LMNO$ must be a parallelogram. The diagram is not to scale.



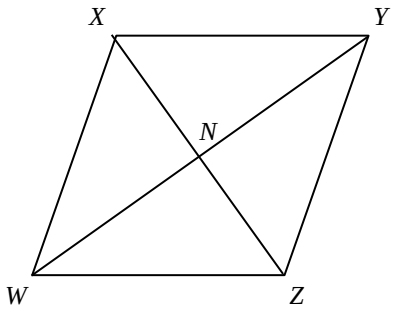
a. $x = 9, y = \frac{2}{5}$
b. $x = 0, y = \frac{2}{5}$
c. $x = 0, y = \frac{5}{2}$
d. $x = 9, y = \frac{5}{2}$

____ 17. If $m\angle B = m\angle D = 41$, find $m\angle C$ so that quadrilateral *ABCD* is a parallelogram. The diagram is not to scale.



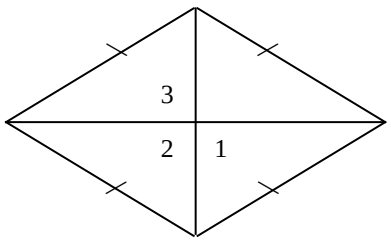
a. 41 b. 139 c. 82 d. 278

____ 18. Which statement can you use to conclude that quadrilateral *XYZW* is a parallelogram?



a. $\overline{XW} \cong \overline{YZ}$ and $\overline{XY} \cong \overline{WZ}$
b. $\overline{XW} \cong \overline{WZ}$ and $\overline{XY} \cong \overline{WZ}$
c. $\overline{YN} = \overline{NX}$ and $\overline{XN} = \overline{NY}$
d. $\overline{XW} \cong \overline{YZ}$ and $\overline{XY} \cong \overline{YZ}$

____ 19. In the rhombus, $m\angle 1 = 15x$, $m\angle 2 = x + y$, and $m\angle 3 = 30z$. Find the value of each variable. The diagram is not to scale.

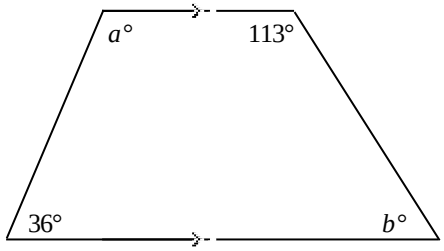


a. $x = 12$, $y = 84$, $z = 20$
b. $x = 6$, $y = 174$, $z = 20$
c. $x = 6$, $y = 84$, $z = 10$
d. $x = 12$, $y = 174$, $z = 10$

____ 20. *DEFG* is a rectangle. $DF = 5x - 5$ and $EG = x + 11$. Find the value of *x* and the length of each diagonal.
a. $x = 4$, $DF = 13$, $EG = 13$
b. $x = 4$, $DF = 15$, $EG = 18$
c. $x = 4$, $DF = 15$, $EG = 15$
d. $x = 2$, $DF = 13$, $EG = 13$

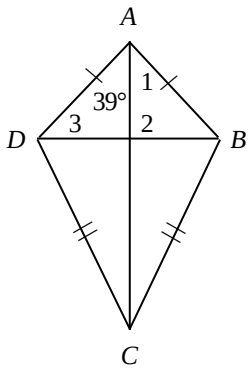
____ 21. Which description does NOT guarantee that a quadrilateral is a parallelogram?
a. a quadrilateral with both pairs of opposite sides congruent
b. a quadrilateral with the diagonals bisecting each other
c. a quadrilateral with consecutive angles supplementary
d. quadrilateral with two opposite sides parallel

____ 22. Find the values of *a* and *b*.The diagram is not to scale.



a. $a = 144, b = 67$
b. $a = 144, b = 36$
c. $a = 113, b = 67$
d. $a = 113, b = 36$

____ 23. Find $m\angle 1$ and $m\angle 3$ in the kite. The diagram is not to scale.

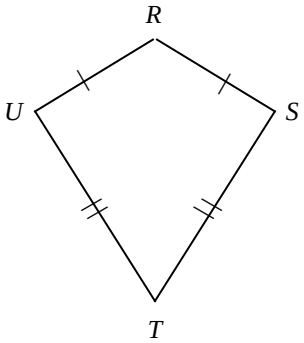


a. 51, 51
b. 39, 39
c. 39, 51
d. 51, 39

____ 24. Which description does NOT guarantee that a trapezoid is isoscles?
a. congruent diagonals
b. both pairs of base angles congruent
c. congruent bases
d. congruent legs

____ 25. $\angle J$ and $\angle M$ are base angles of isosceles trapezoid *JKLM*. If $m\angle J = 20x + 9$, and $m\angle M = 14x + 15$, find $m\angle K$.
a. 151
b. 1
c. 29
d. 75.5

____ 26. $m\angle R = 130$ and $m\angle S = 80$. Find $m\angle T$. The diagram is not to scale.

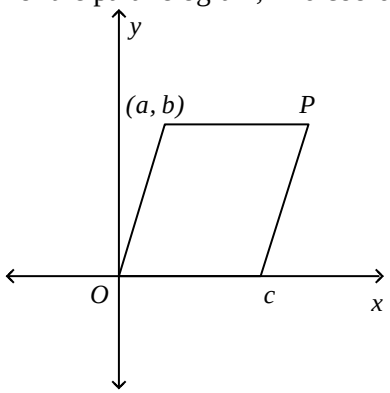


a. 65
b. 70
c. 35
d. 80

____ 27. One side of a kite is 8 cm less than four times the length of another side. The perimeter of the kite is 78 cm. Find the lengths of the sides of the kite.

a. 9.4 cm and 29.6 cm
b. 23.5 cm and 86 cm
c. 23.5 cm
d. 9.4 cm

____ 28. For the parallelogram, find coordinates for *P* without using any new variables.



a. $(a - c, c)$
b. (c, a)
c. $(a + c, b)$
d. (c, b)

Short Answer

30. a. Place the points *A*(–5, 2), B(–3, 6), C(6, 6), and *D*(4, 2) on the coordinate plane and construct the quadrilateral.

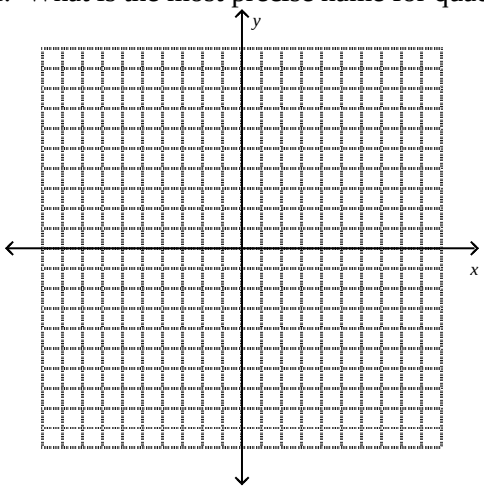
b. Using the distance formula, find the length of each side as well as the length of each diagonal (round to the nearest tenth if necessary).

c. Using the slope formula, determine if the sides are parallel and or perpendicular.

d. Using the slope formula, determine if the diagonals are perpendicular.

e. Using the midpoint formula, determine if the diagonals bisect eachother.

f. What is the most precise name for quadrilateral *ABCD.*



Geometry Semester 2 Review 2013-Quadrilaterals
Answer Section

MULTIPLE CHOICE

1. A
2. C
3. C
4. B
5. C
6. B
7. D
8. D
9. D
10. C
11. C
12. B
13. C
14. B
15. C
16. D
17. B
18. A
19. C
20. C
21. D
22. A
23. C
24. C
25. A
26. B
27. A
28. C
29. B

SHORT ANSWER

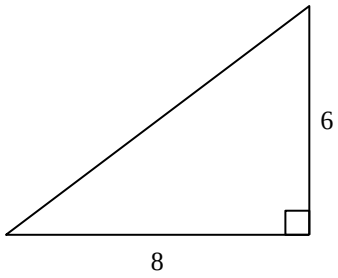
30. parallelogram

Geometry Semester 2 Review 2013

RIGHT TRIANGLES & TRIGONOMETRY
Pythagorean Theorem
Radical Form
30-60-90
45-45-90
SOH CAH TOA
Inverse Functions
Angles of Elevation and Depression
Vectors

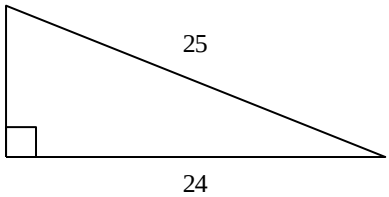
Find the length of the missing side. The triangle is not drawn to scale.

____ 1.



a. 28 b. 100 c. 10 d. 48

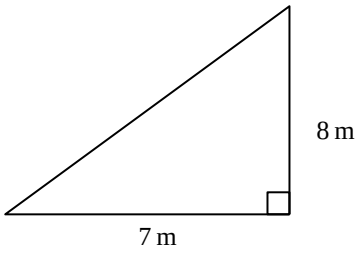
____ 2.



a. 35 b. 49 c. 7 d. 2

Find the length of the missing side. Leave your answer in simplest radical form.

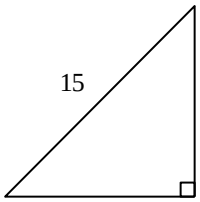
____ 3.



Not drawn to scale

a. $\sqrt{17}$ m b. 113 m c. $\sqrt{113}$ m d. $\sqrt{71}$ m

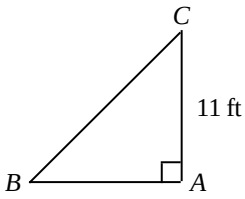
____ 4.



Not drawn to scale

a. $3\sqrt{29}$ cm b. $3\sqrt{21}$ cm c. $\sqrt{21}$ cm d. 3 cm

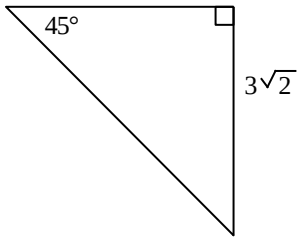
____ 5. In triangle *ABC*, $\angle A$ is a right angle and $m\angle B = 45°$. Find *BC*. If you answer is not an integer, leave it in simplest radical form.



Not drawn to scale

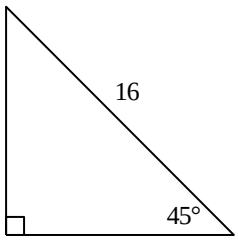
a. 22 ft b. $22\sqrt{2}$ ft c. 11 ft d. $11\sqrt{2}$ ft

____ 6. Find the length of the hypotenuse.



a. 12 b. 6 c. 5 d. 18

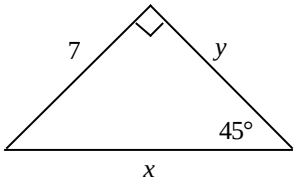
____ 7. Find the length of the leg. If your answer is not an integer, leave it in simplest radical form.



Not drawn to scale

a. 128 b. $8\sqrt{2}$ c. 16 d. $2\sqrt{2}$

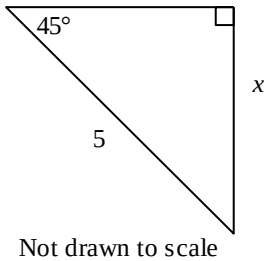
____ 8. Find the lengths of the missing sides in the triangle. Write your answers as integers or as decimals rounded to the nearest tenth.



Not drawn to scale

a. $x = 7, y = 9.9$ b. $x = 9.9, y = 7$ c. $x = 4.9, y = 6.1$ d. $x = 6.1, y = 4.9$

____ 9. Find the value of the variable. If your answer is not an integer, leave it in simplest radical form.

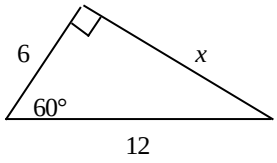


Not drawn to scale

a. $5\sqrt{2}$ b. $\frac{5\sqrt{3}}{2}$ c. $\frac{5\sqrt{2}}{2}$ d. $5\sqrt{3}$

Find the value of the variable(s). If your answer is not an integer, leave it in simplest radical form.

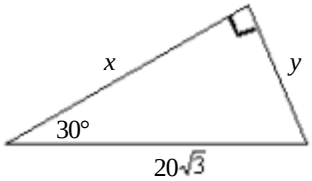
____ 10.



Not drawn to scale

a. 2 b. $12\sqrt{3}$ c. $\frac{1}{2}$ d. $6\sqrt{3}$

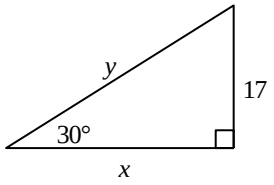
____ 11.



Not drawn to scale

a. $x = 10\sqrt{3}, y = 30$
b. $x = 10, y = 30\sqrt{3}$
c. $x = 30\sqrt{3}, y = 10$
d. $x = 30, y = 10\sqrt{3}$

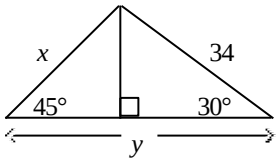
____ 12.



Not drawn to scale

a. $x = 17, y = 34\sqrt{3}$
b. $x = 34, y = 17\sqrt{3}$
c. $x = 34\sqrt{3}, y = 17$
d. $x = 17\sqrt{3}, y = 34$

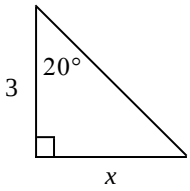
____ 13. Find the value of x and y rounded to the nearest tenth.



a. $x = 48.1, y = 46.4$
b. $x = 48.1, y = 139.3$
c. $x = 24.0, y = 139.3$
d. $x = 24.0, y = 46.4$

Find the value of *x*. Round your answer to the nearest tenth.

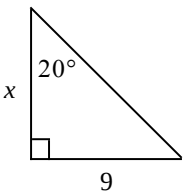
____ 14.



Not drawn to scale

a. 2.8
b. 1
c. 8.2
d. 1.1

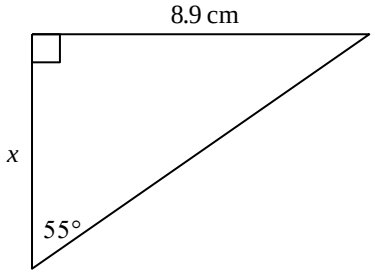
____ 15.



Not drawn to scale

a. 3.3
b. 3.1
c. 24.7
d. 8.5

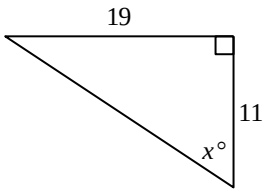
____ 16.



a. 6.2 cm b. 12.7 cm c. 15.5 cm d. 10.9 cm

Find the value of *x* to the nearest degree.

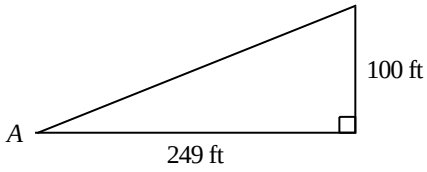
____ 17.



Not drawn to scale

a. 30 b. 60 c. 70 d. 85

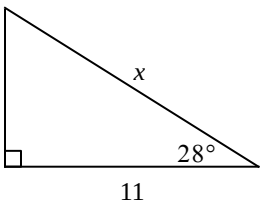
____ 18. A large totem pole in the state of Washington is 100 feet tall. At a particular time of day, the totem pole casts a 249-foot-long shadow. Find the measure of $\angle A$ to the nearest degree.



a. 68° b. 45° c. 35° d. 22°

Find the value of *x*. Round to the nearest tenth.

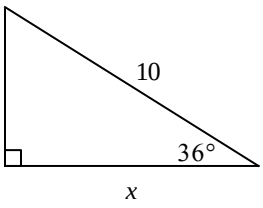
____ 19.



Not drawn to scale

a. 12.5 b. 10 c. 13 d. 9.7

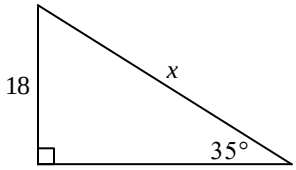
____ 20.



Not drawn to scale

a. 12.9 b. 8.5 c. 12.4 d. 8.1

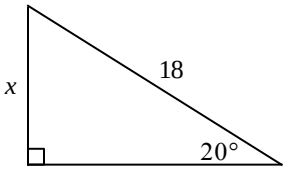
____ 21.



Not drawn to scale

a. 10.3 b. 31.4 c. 10.7 d. 31.8

____ 22.

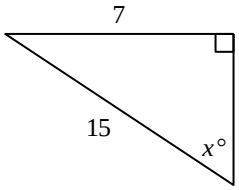


Not drawn to scale

a. 52.6 b. 52.9 c. 6.2 d. 6.5

Find the value of *x*. Round to the nearest degree.

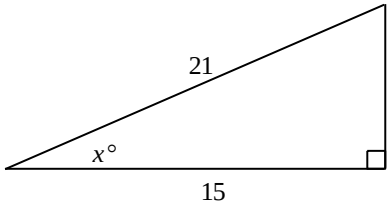
____ 23.



Not drawn to scale

a. 62 b. 25.5 c. 28 d. 25

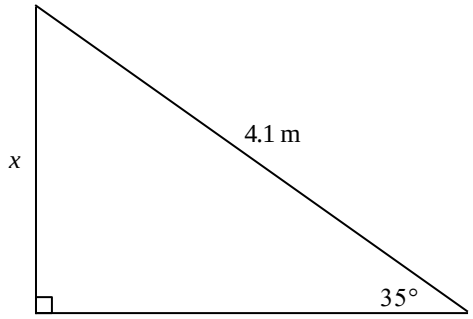
____ 24.



Not drawn to scale

a. 41 b. 36 c. 46 d. 44

____ 25. A slide 4.1 meters long makes an angle of 35° with the ground. To the nearest tenth of a meter, how far above the ground is the top of the slide?



a. 7.1 m b. 3.4 m c. 5.0 m d. 2.4 m

____ 26. To find the height of a pole, a surveyor moves 140 feet away from the base of the pole and then, with a transit 4 feet tall, measures the angle of elevation to the top of the pole to be 44°. To the nearest foot, what is the height of the pole?

a. 145 ft b. 149 ft c. 135 ft d. 139 ft

____ 27. A spotlight is mounted on a wall 7.4 feet above a security desk in an office building. It is used to light an entrance door 9.3 feet from the desk. To the nearest degree, what is the angle of depression from the spotlight to the entrance door?

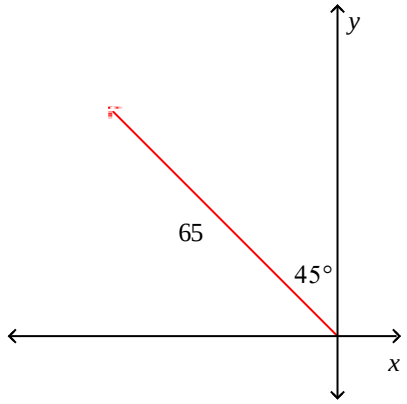
a. 39° b. 51° c. 53° d. 37°

____ 28. Find the angle of elevation of the sun from the ground to the top of a tree when a tree that is 10 yards tall casts a shadow 14 yards long. Round to the nearest degree.

a. 54° b. 36° c. 46° d. 44°

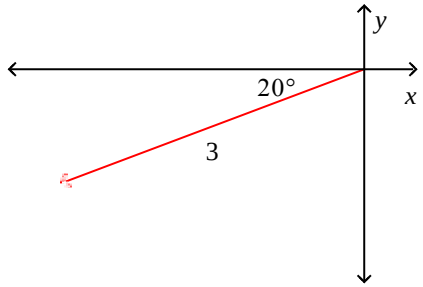
Describe the vector as an ordered pair. Give the coordinates to the nearest tenth. (Not drawn to scale)

____ 29.



a. ⟨−91.9, 91.9⟩
b. ⟨−46, 46⟩
c. ⟨−91.9, 91.9⟩
d. ⟨−46, 46⟩

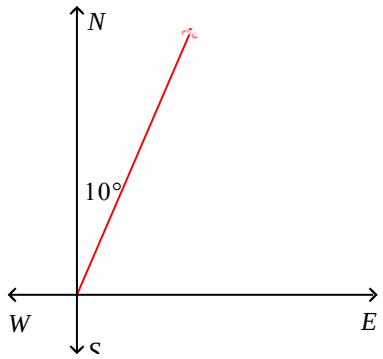
____ 30.



a. ⟨−1, −2.8⟩
b. ⟨−8.8, −3.2⟩
c. ⟨−3.2, −8.8⟩
d. ⟨−2.8, −1⟩

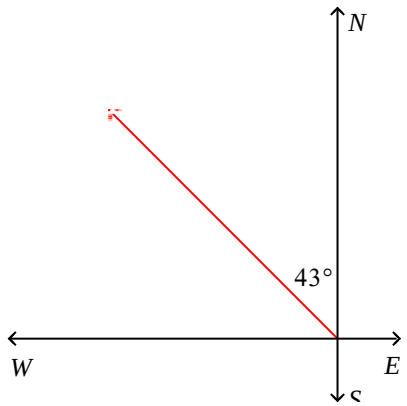
Use compass directions to describe the direction of the vector.
(Not drawn to scale)

____ 31.



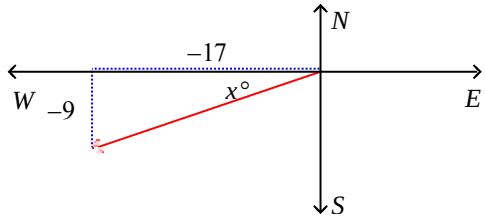
a. 10° west of south
b. 10° east of north
c. 10° east of south
d. 10° west of north

____ 32.



a. 43° east of north
b. 43° east of south
c. 43° west of south
d. 43° west of north

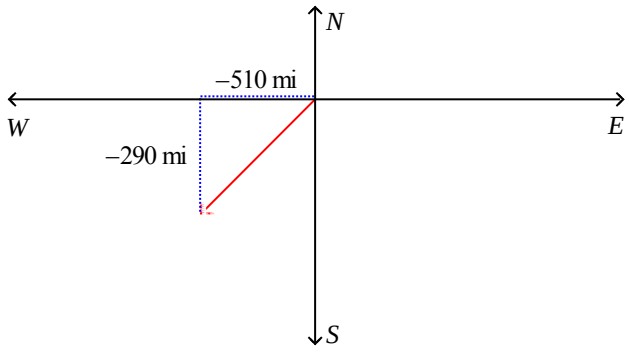
____ 33. A glider lands 17 miles west and 9 miles south from where it took off. The result of the trip can be described by the vector $\langle -17, -9 \rangle$. Use distance (for magnitude) and direction to describe this vector a second way.



a. 19 miles at 28° south of west
b. 28 miles at 19° north of west
c. 19 miles at 28° north of west
d. 28 miles at 19° south of west

Find the magnitude and direction of the vector. Round length to nearest tenth and degree to the nearest unit. (Not drawn to scale)

____ 34.



a. about 586.7 mi; 30° south of east
b. about 586.7 mi; 30° south of west
c. about 30 mi; 586.7° south of east
d. about 30 mi; 586.7° south of west

Write the sum of the two vectors as an ordered pair.

____ 35. $\langle 1, 6\rangle$ and $\langle -5, -2\rangle$
a. $\langle 7, -7\rangle$ b. $\langle -4, 4\rangle$ c. $\langle -7, 7\rangle$ d. $\langle 4, -4\rangle$

____ 36. $\langle -6, 5\rangle$ and $\langle 6, -5\rangle$
a. $\langle 0, 0\rangle$ b. $\langle -12, -10\rangle$ c. $\langle 12, 10\rangle$ d. $\langle 1, 1\rangle$

Short Answer

37. A forest ranger spots a fire from a 21-foot tower. The angle of depression from the tower to the fire is 12°.
a. Draw a diagram to represent this situation.
b. To the nearest foot, how far is the fire from the base of the tower? Show the steps you use to find the solution.

Essay

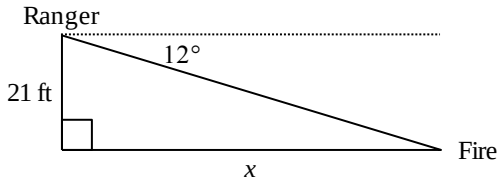
38. From the top of a 210-foot lighthouse located at sea level, a boat is spotted at an angle of depression of 23°.
a. Draw a sketch to represent this situation.
b. Use the angle of depression to find the distance from the base of the lighthouse to the boat. Explain your steps in finding the distance.
c. Use another angle to verify the distance you found in part (b). Explain your steps in finding the distance and tell why your method works.
d. Use the Pythagorean Theorem to find the shortest distance from the top of the lighthouse to the boat. Explain your steps in finding this distance.

Geometry Semester 2 Review 2013 Right Triangles
Answer Section

MULTIPLE CHOICE

1. C
2. C
3. C
4. B
5. D
6. B
7. B
8. B
9. C
10. D
11. D
12. D
13. D
14. D
15. C
16. A
17. B
18. D
19. A
20. D
21. B
22. C
23. C
24. D
25. D
26. D
27. A
28. B
29. D
30. D
31. B
32. D
33. A
34. B
35. B
36. A
37.

a.



b. $\tan 12° = \frac{21}{x}$ Use the tangent ratio.

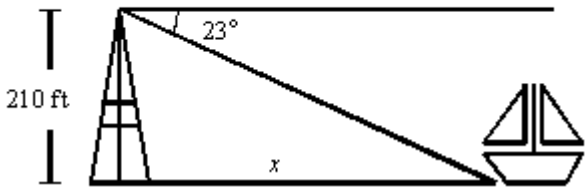
$x = \frac{21}{\tan 12°}$ Solve for x.

$x \approx 99$

The fire is about 99 feet from the base of the tower.

38.

[4] **a.**



b. $\tan 23° = \frac{210}{x}$ Use the tangent ratio.

$\tan 23°(x) = 210$ Multiply each side by x.

$\frac{\tan 23°(x)}{\tan 23°} = \frac{210}{\tan 23°}$ Divide each side by tan 23°.

$x \approx 494.7$ Use a calculator.

The distance from the base of the lighthouse to the boat is about 494.7 feet.

c. Since the measures of the acute angles of a right triangle add to 90°, you can use the other angle in the triangle to find the distance. The measure of the other acute angle is 90° – 23°, or 67°.

$\tan 67° = \frac{x}{210}$ Use the tangent ratio.

$x = 210(\tan 67°)$ Multiply each side by 210.

$x \quad 494.7$ Use a calculator.

d. The shortest distance from the top of the lighthouse to the boat is the hypotenuse of the right triangle with legs of length 210 feet and 494.7 feet.

$a^2 + b^2 = c^2$ Pythagorean Theorem

$210^2 + 494.7^2 = c^2$ Substitute.

$44{,}100 + 244{,}728 = c^2$ Simplify.

$288{,}828 = c^2$ Simplify.

$537.4 \approx c$ Use a calculator.

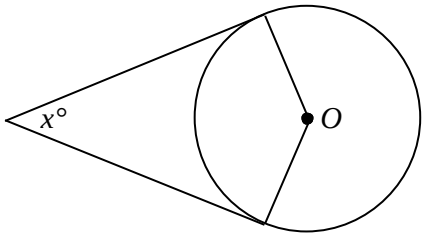
The shortest distance from the top of the lighthouse to the boat is about 537.4 feet.

Geometry Semester 2 Review 2013

CIRCLES:
Tangent Lines
Chords & Arcs
Central Angles
Inscribed Angles
Angle Measures and Side Lengths
Circumference/Arc Length
Major/Minor Arcs/Semicircles

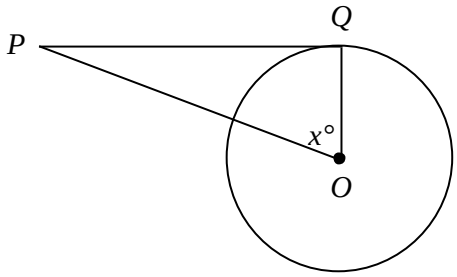
Assume that lines that appear to be tangent are tangent. *O* is the center of the circle. Find the value of *x*. (Figures are not drawn to scale.)

____ 1. $m\angle O = 111$



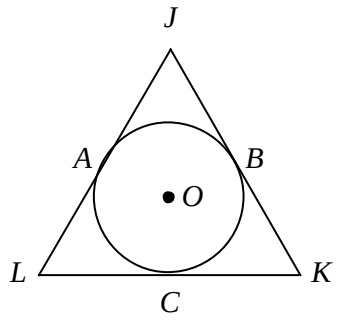
a. 291 b. 69 c. 55.5 d. 222

____ 2. $m\angle P = 12$



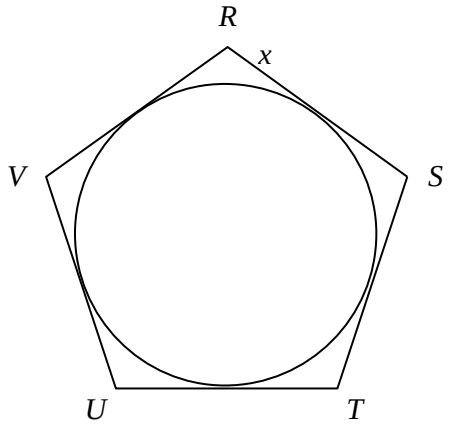
a. 78 b. 39 c. 102 d. 24

____ 3. $\overline{JK}$, $\overline{KL}$, and $\overline{LJ}$ are all tangent to *O* (not drawn to scale). *JA* = 9, *AL* = 10, and *CK* = 14. Find the perimeter of $\triangle JKL$.



a. 66 b. 38 c. 46 d. 33

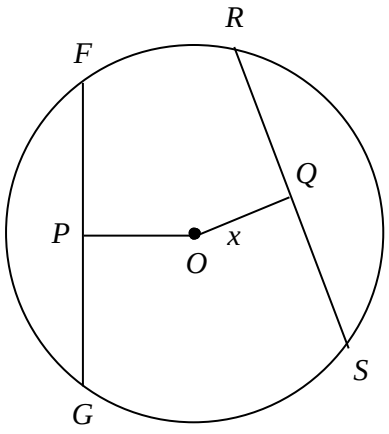
____ 4. Pentagon *RSTUV* is circumscribed about a circle. Solve for *x* for *RS* = 10, *ST* = 13, *TU* = 11, *UV* = 12, and *VR* = 12. The figure is not drawn to scale.



a. 4 b. 8 c. 11 d. 6

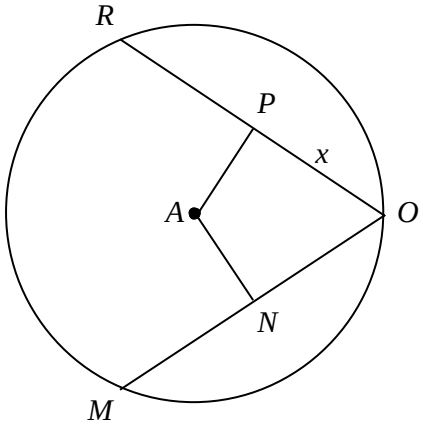
Find the value of *x*. If necessary, round your answer to the nearest tenth. The figure is not drawn to scale.

____ 5. $\overline{FG} \perp \overline{OP}$, $\overline{RS} \perp \overline{OQ}$, $FG = 40$, $RS = 37$, $OP = 19$



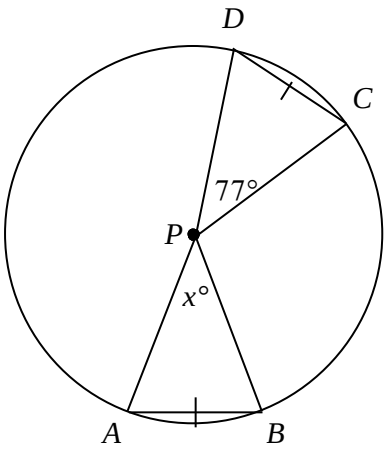
a. 27.2 b. 18.5 c. 19 d. 20.5

____ 6. $\overline{NA} \cong \overline{PA}$, $\overline{MO} \perp \overline{NA}$, $\overline{RO} \perp \overline{PA}$, $MN = 6$ feet



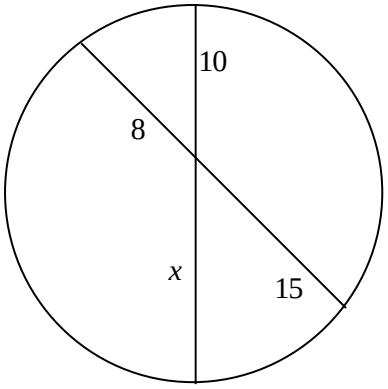
a. 12 ft b. 36 ft c. 6 ft d. 3 ft

____ 7.



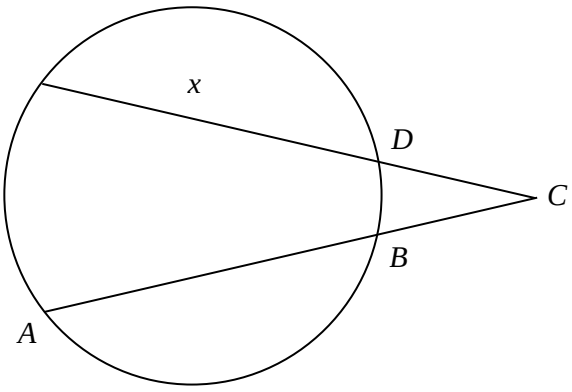
a. 13 b. 26 c. 77 d. 38.5

____ 8.



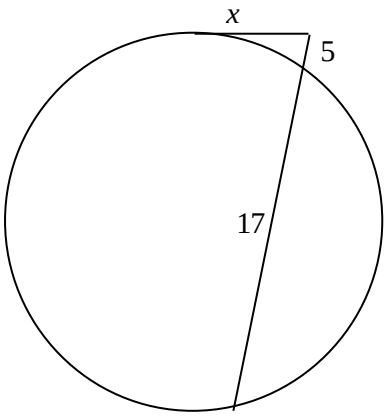
a. 18.8 b. 120 c. 5.3 d. 12

____ 9. $AB = 20$, $BC = 6$, and $CD = 8$



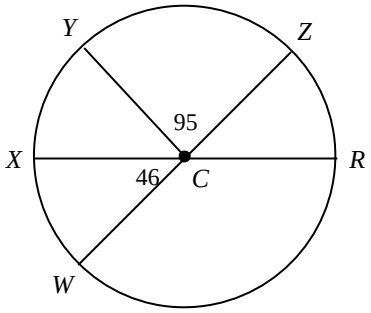
a. 18.5 b. 11.5 c. 19.5 d. 15

____ 10.



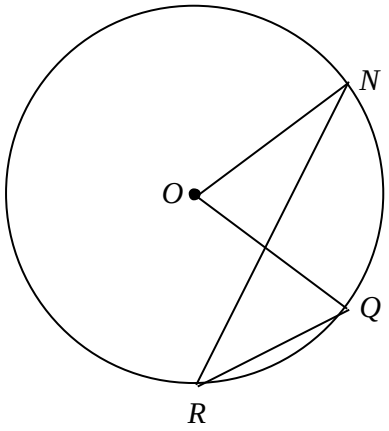
a. 19.34 b. 10.49 c. 110 d. 9.22

____ 11. $\overline{WZ}$ and $\overline{XR}$ are diameters. Find the measure of arc *ZWX*. (The figure is not drawn to scale.)



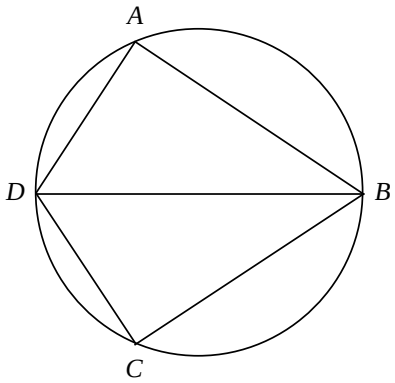
a. 226 b. 275 c. 39 d. 321

____ 12. $m\angle R = 22$. Find $m\angle O$. (The figure is not drawn to scale.)



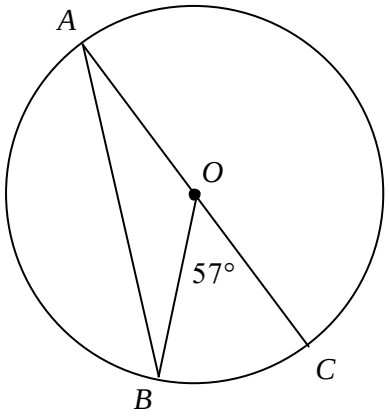
a. 68 b. 22 c. 158 d. 44

____ 13. Given that $\angle DAB$ and $\angle DCB$ are right angles and $m\angle BDC = 41$, what is the measure of arc CAD? (The figure is not drawn to scale.)



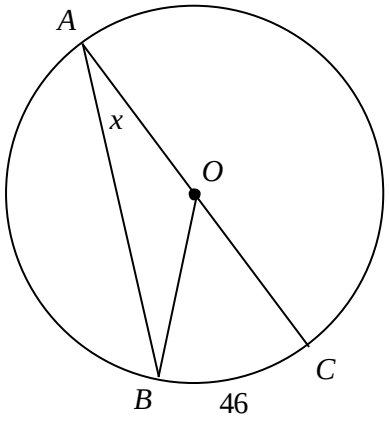
a. 164 b. 303 c. 246 d. 262

____ 14. Find the measure of $\angle BAC$. (The figure is not drawn to scale.)



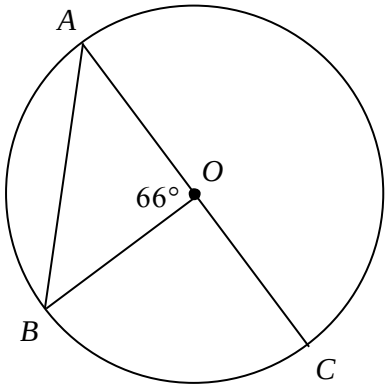
a. 57 b. 28.5 c. 33 d. 114

____ 15. Find x. (The figure is not drawn to scale.)



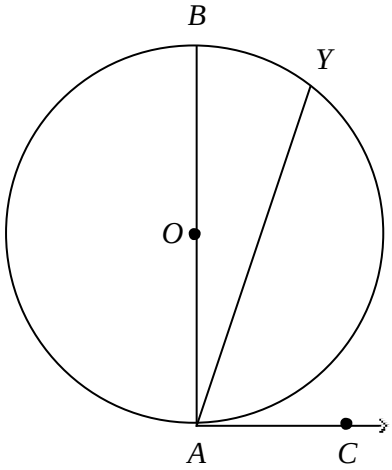
a. 92 b. 44 c. 23 d. 46

____ 16. Find $m\angle BAC$. (The figure is not drawn to scale.)



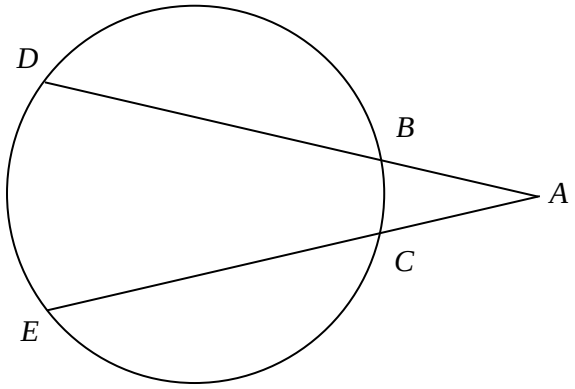
a. 114 b. 57 c. 132 d. 33

____ 17. If m(arc BY) = 40, what is $m\angle YAC$? (The figure is not drawn to scale.)



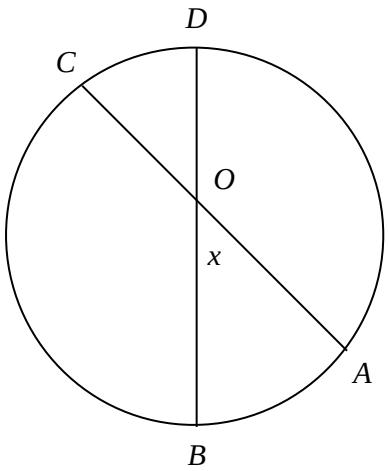
a. 140 b. 100 c. 70 d. 80

____ 18. m(arc DE) = 96 and m(arc BC) = 67. Find $m\angle A$. (The figure is not drawn to scale.)



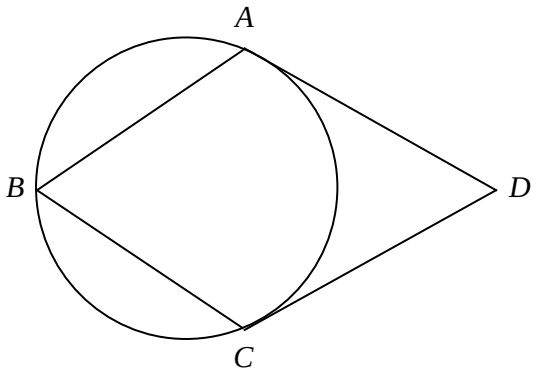
a. 14.5 b. 62.5 c. 81.5 d. 29

____ 19. Find the value of x for m(arc AB) = 46 and m(arc CD) = 25. (The figure is not drawn to scale.)



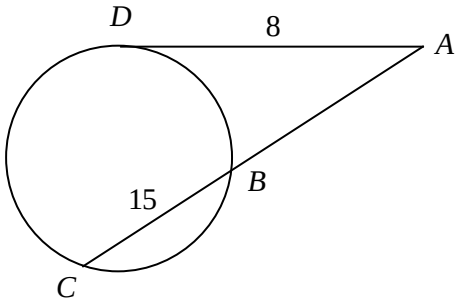
a. 35.5° b. 58.5° c. 71° d. 21°

____ 20. Find $m\angle D$ for $m\angle B$ = 50. (The figure is not drawn to scale.)



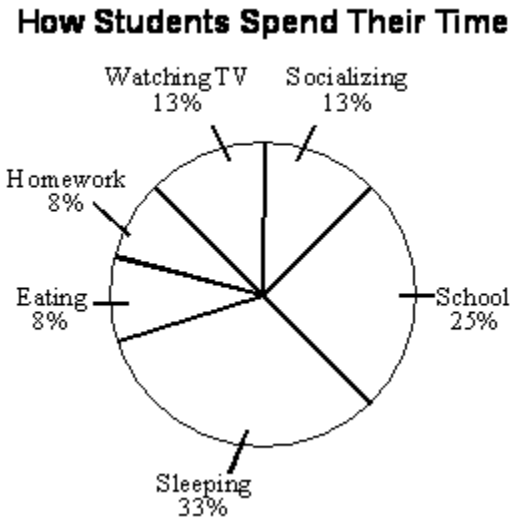
a. 80 b. 130 c. 65 d. 160

____ 21. Find *AB*. Round to the nearest tenth if necessary.



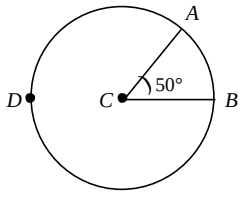
a. 1.1 b. 11.5 c. 3.5 d. 4.3

____ 22. Grade 7 students were surveyed to determine how many hours a day they spent on various activities. The results are shown in the circle graph below. Find the measure of each central angle in the circle graph.
a. Sleeping
b. Eating



a. 118.8°; 28.8° b. 108°; 28.8° c. 118.8°; 288° d. 59.4°; 288°

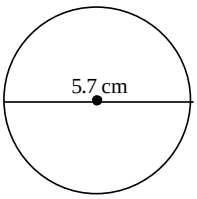
____ 23. Name the major arc and find its measure.



a. arc *ADB*; 50° b. arc *AB*; 50° c. arc *ADB*; 310° d. arc *AB*; 310°

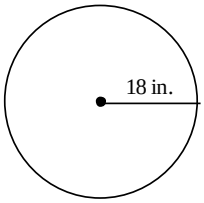
Find the circumference. Leave your answer in terms of π.

____ 24.



a. 11.4π cm b. 8.55π cm c. 2.85π cm d. 5.7π cm

____ 25.

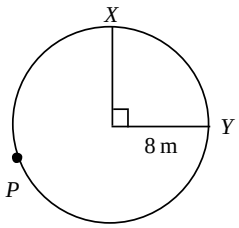


a. 54π in. b. 36π in. c. 18π in. d. 324π in.

____ 26. A team in science class placed a chalk mark on the side of a wheel and rolled the wheel in a straight line until the chalk mark returned to the same position. The team then measured the distance the wheel had rolled and found it to be 35 cm. To the nearest tenth, what is the area of the wheel?

a. 195.1 cm^2 b. 97.5 cm^2 c. 27.5 cm^2 d. 390.1 cm^2

____ 27. Find the length of arc *XPY*. Leave your answer in terms of π.



a. 24π m b. 12π m c. 4π m d. 720π m

Geometry Semester 2 Review 2013 - Circles
Answer Section

MULTIPLE CHOICE

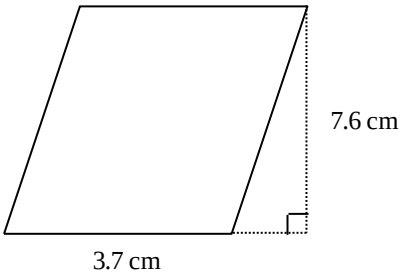
1. B
2. A
3. A
4. A
5. D
6. D
7. C
8. D
9. B
10. B
11. A
12. D
13. D
14. B
15. C
16. B
17. C
18. A
19. A
20. A
21. C
22. A
23. C
24. D
25. B
26. B
27. B

Geometry Semester 2 Review 2013

AREA OF:
Circles & Sectors/Segment
Parallelogram
Triangle
Trapezoid
Rhombus
Kite
Regular Polygons
Using special right triangles
Using trigonometry

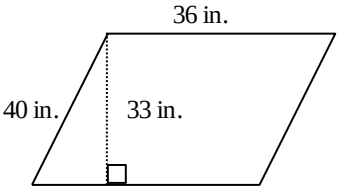
Find the area. The figure is not drawn to scale.

____ 1.



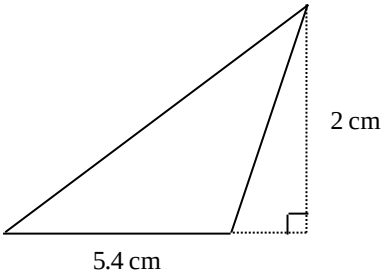
a. 28.12 cm^2 b. 3.9 cm^2 c. 11.3 cm^2 d. 56.24 cm^2

____ 2.



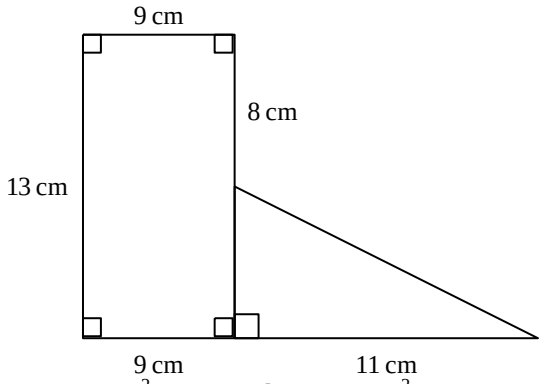
a. 1188 $in.^2$ b. 69 $in.^2$ c. 138 $in.^2$ d. 1440 $in.^2$

____ 3.



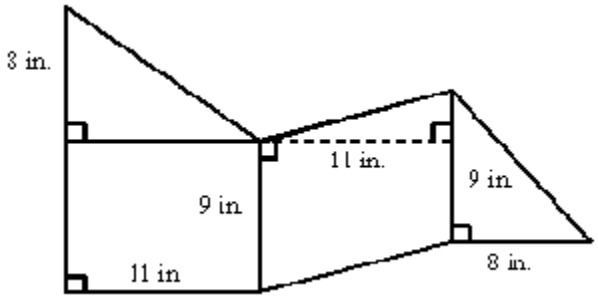
a. 10.8 cm^2 b. 5.4 cm^2 c. 21.6 cm^2 d. 7.4 cm^2

____ 4.



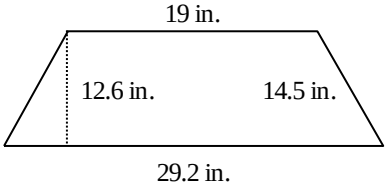
a. 144.5 cm^2 b. 127 cm^2 c. 172 cm^2 d. 50 cm^2

____ 5.



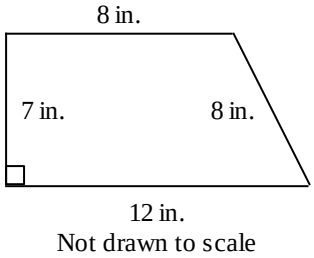
a. 188 $in.^2$ b. 278 $in.^2$ c. 322 $in.^2$ d. none of these

____ 6.



a. 607.32 $in.^2$ b. 36.7 $in.^2$ c. 303.66 $in.^2$ d. 77.2 $in.^2$

____ 7.



Not drawn to scale

a. 77.2 $in.^2$ b. 80 $in.^2$ c. 75 $in.^2$ d. 70 $in.^2$

____ 8. The area of a parallelogram is 420 cm^2 and the height is 35 cm. Find the corresponding base.

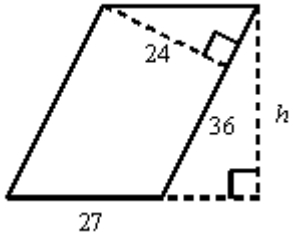
a. 385 cm b. 455 cm c. 14,700 cm^2 d. 12 cm

Find the area of a parallelogram with the given vertices.

____ 9. $P(1, 3)$, $Q(3, 3)$, $R(7, 8)$, $S(9, 8)$
a. 10 units^2 b. 5 units^2 c. 20 units^2 d. none of these

____ 10. $P(–2, –5)$, $Q(9, –5)$, $R(1, 5)$, $S(12, 5)$
a. 110 units^2 b. 55 units^2 c. 220 units^2 d. none of these

____ 11. Find the value of h in the parallelogram.

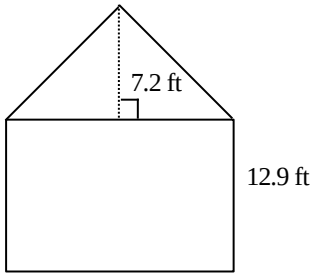


Not drawn to scale
a. 32 b. 28 c. 40.5 d. 35

____ 12. An isosceles triangle has area of 110 ft^2. If the base is 14 ft, what is the length of the legs? Round your answer to the nearest tenth.
a. 21 ft b. 17.2 ft c. 14.8 ft d. 442.9 ft

____ 13. Find the area of a polygon with the vertices of (–2, 3), (1, 3), (5, –3), and (–2, –3).
a. 120 units^2 b. 7 units^2 c. 30 units^2 d. 60 units^2

____ 14. When designing a building, you must be sure that the building can withstand hurricane-force winds, which have a velocity of 73 mi/h or more. The formula $F = 0.004Av^2$ gives the force F in pounds exerted by a wind blowing against a flat surface. A is the area of the surface in square feet, and v is the wind velocity in miles per hour. How much force is exerted by a wind blowing at 81 mi/h against the side of the building shown?

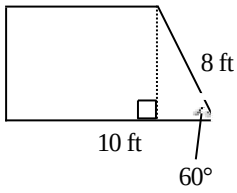


Not drawn to scale

a. about 54 tons
b. about 5 tons
c. about 10,826 tons
d. about 28 tons

Find the area of the trapezoid. Leave your answer in simplest radical form.

____ 15.



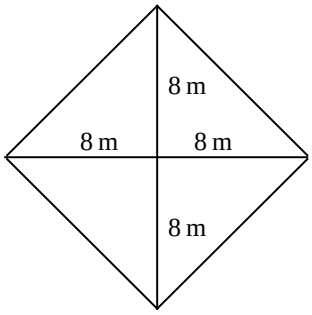
Not drawn to scale

a. $40\sqrt{3}$ ft^2 b. $16\sqrt{3}$ ft^2 c. $24\sqrt{3}$ ft^2 d. $32\sqrt{3}$ ft^2

____ 16. A kite has diagonals 9.2 ft and 8 ft. What is the area of the kite?

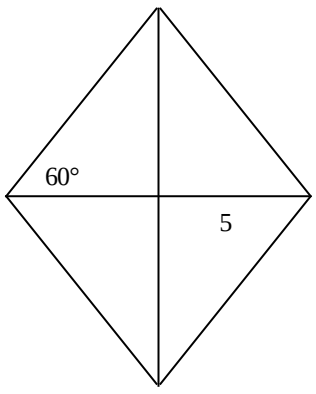
a. 36.8 ft^2 b. 8.6 ft^2 c. 73.6 ft^2 d. 34.4 ft^2

____ 17. Find the area of the rhombus.



a. 12 m^2 b. 4096 m^2 c. 128 m^2 d. 32 m^2

____ 18. Find the area of the rhombus. Leave your answer in simplest radical form.



Not drawn to scale

a. 50 b. $10\sqrt{3}$ c. $25\sqrt{6}$ d. $50\sqrt{3}$

____ 19. Find the area of a regular hexagon with an apothem 16.5 feet long and a side 19 feet long. Round your answer to the nearest tenth.

a. 156.3 ft^2 b. 625.3 ft^2 c. 1875.8 ft^2 d. 937.9 ft^2

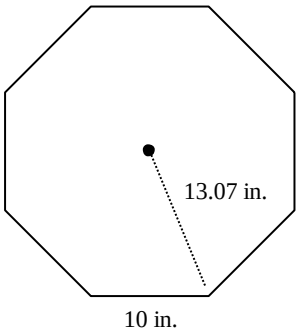
____ 20. Find the area of a regular hexagon with side length of 8 m. Round your answer to the nearest tenth.

a. 55.4 m^2 b. 166.3 m^2 c. 83.1 m^2 d. 288 m^2

____ 21. Find the area of an equilateral triangle with side 12.

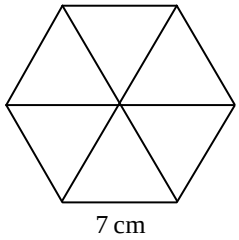
a. $36\sqrt{3}$ b. 72 c. 36 d. $3\sqrt{3}$

____ 22. Find the area of the regular polygon. Round your answer to the nearest tenth.



a. 176.6 in.^{2} b. 966.1 in.^{2} c. 80.0 in.^{2} d. 483.0 in.^{2}

____ 23. You are planning to use a ceramic tile design in your new bathroom. The tiles are blue and white equilateral triangles. You decide to arrange the blue tiles in a hexagonal shape as shown. If the side of each tile measures 7 centimeters, what will be the exact area of each hexagonal shape?



a. $73.5\sqrt{3}$ cm^2 b. $98\sqrt{3}$ cm^2 c. 21 cm^2 d. 1029 cm^2

____ 24. Find the area of an equilateral triangle with radius $8\sqrt{3}$ m. Leave your answer in simplest radical form.

a. $96\sqrt{3}$ m^2 b. $144\sqrt{3}$ m^2 c. $18\sqrt{3}$ m^2 d. $12\sqrt{3}$ m^2

____ 25. A regular hexagon has a perimeter of 150 m. Find its area. Leave your answer in simplest radical form.

a. $5625\sqrt{3}$ m^2 b. $\frac{1875}{2}\sqrt{3}$ m^2 c. $\frac{25}{4}\sqrt{3}$ m^2 d. $\frac{5625}{2}\sqrt{3}$ m^2

Find the area of the regular polygon. Give the answer to the nearest tenth.

____ 26. pentagon with side 10 cm

a. 344.1 cm^2 b. 34.4 cm^2 c. 137.6 cm^2 d. 172 cm^2

____ 27. hexagon with side 8 yd

a. 332.6 yd^2 b. 12 yd^2 c. 41.6 yd^2 d. 166.3 yd^2

____ 28. decagon with side 4 cm

a. 123.1 cm^2 b. 129.4 cm^2 c. 246.2 cm^2 d. 139.8 cm^2

____ 29. dodecagon with perimeter 108 cm

a. 1813.8 cm^2 b. 906.9 cm^2 c. 923.6 cm^2 d. 938.9 cm^2

____ 30. pentagon with radius 8 m

a. 304.3 m^2 b. 152.2 m^2 c. 30.4 m^2 d. 154.2 m^2

____ 31. square with radius 16 ft

a. 520 ft^2 b. 512 ft^2 c. 256 ft^2 d. 1024 ft^2

____ 32. hexagon with radius 5 in.

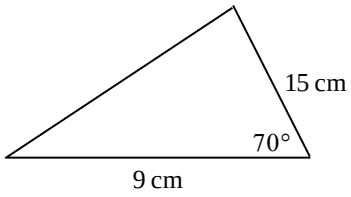
a. 259.8 in.^{2} b. 129.9 in.^{2} c. 65.0 in.^{2} d. 53.0 in.^{2}

____ 33. The Ruffs are planning to buy an above-ground swimming pool shaped as a regular octagon. The radius of the octagon is 9 feet. To the nearest tenth, find the area of the surface of the water in the pool.

a. 458.2 ft^2 b. 553.1 ft^2 c. 94.8 ft^2 d. 229.1 ft^2

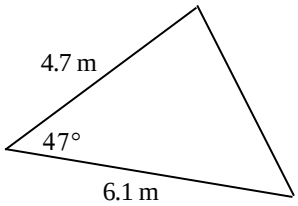
Find the area of the triangle. Give the answer to the nearest tenth. The drawing may not be to scale.

____ 34.



a. 126.9 cm^2 b. 63.4 cm^2 c. 23.1 cm^2 d. 185.5 cm^2

____ 35.



a. 10.5 m^2 b. 9.8 m^2 c. 19.6 m^2 d. 21.0 m^2

____ 36. A gardener needs to cultivate a triangular plot of land. One angle of the garden is 47°, and two sides adjacent to the angle are 77 feet and 76 feet. To the nearest tenth, what is the area of the plot of land?

a. 2163.5 ft^2 b. 2139.9 ft^2 c. 4279.9 ft^2 d. 1995.5 ft^2

____ 37. A park in a subdivision is triangular-shaped. Two adjacent sides of the park are 573 feet and 536 feet. The angle between the sides is 58°. To the nearest unit, find the area of the park in square yards.

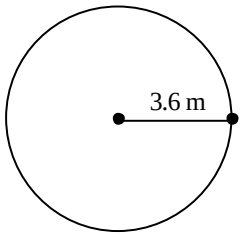
a. 32,557 yd^2 b. 14,470 yd^2 c. 28,940 yd^2 d. 43,410 yd^2

____ 38. Divers looking for a sunken ship have defined the search area as a triangle with adjacent sides of length 2.75 miles and 1.32 miles. The angle between the sides of the triangle is 35°. To the nearest hundredth, find the search area.

a. 2.08 mi^2 b. 2.97 mi^2 c. 1.04 mi^2 d. 1.49 mi^2

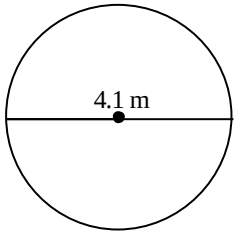
Find the area of the circle. Leave your answer in terms of π.

____ 39.



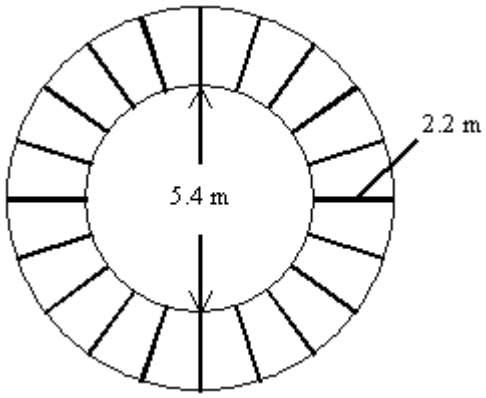
a. 25.92π m^2 b. 1.8π m^2 c. 12.96π m^2 d. 46.66π m^2

____ 40.



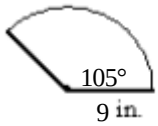
a. 4.2025π m^2 b. 8.405π m^2 c. 16.81π m^2 d. 11.2π m^2

____ 41. The figure represents the overhead view of a deck surrounding a hot tub. What is the area of the deck? Round to the nearest tenth.



a. 75.4 m^2 b. 89.8 m^2 c. 278.7 m^2 d. 22.9 m^2

____ 42. Find the area of the figure to the nearest tenth.



a. 74.2 in.^{2} b. 8.2 in.^{2} c. 148.4 in.^{2} d. 23.6 in.^{2}

____ 43. Find the area of a sector with a central angle of 180° and a diameter of 5.6 cm. Round to the nearest tenth.

a. 49.2 cm^2 b. 12.3 cm^2 c. 2.2 cm^2 d. 5.6 cm^2

Essay

44. An outdoor deck for a new restaurant forms a square with radius 30 feet.
    a. Draw and label a diagram of the deck. Explain your diagram.
    b. Find the perimeter of the deck. Explain your method for finding the perimeter.
    c. Find the area of the deck. Explain your method for finding the area.
    d. Show a method for finding the area of the deck that is different from the method you used in part (c).

Geometry Semester 2 Review 2013 - AREA
Answer Section

MULTIPLE CHOICE

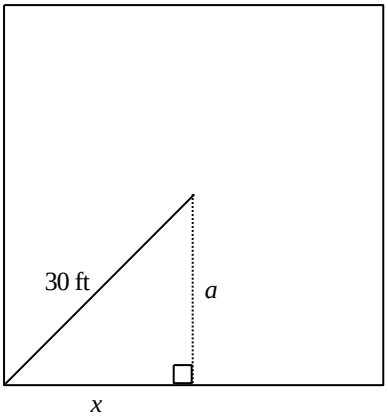
1. A
2. A
3. B
4. A
5. B
6. C
7. D
8. D
9. A
10. A
11. A
12. B
13. C
14. B
15. D
16. A
17. C
18. D
19. D
20. B
21. A
22. D
23. A
24. B
25. B
26. D
27. D
28. A
29. B
30. B
31. B
32. C
33. D
34. B
35. A
36. B
37. B
38. C
39. C
40. A
41. B

42. A
43. B

ESSAY

44.

[4] **a.**



The radius of the square from its center to a corner is 30 feet. A triangle can be formed where x is half the side length and a is the apothem.

b. The triangle in the diagram is a 45°-45°-90° triangle. The hypotenuse 30 is $x\sqrt{2}$ and $a\sqrt{2}$ and $a = x$. To find the value of x, or a, write and solve an equation.

$30 = x\sqrt{2}$ Write an equation.

$\frac{30}{\sqrt{2}} = \frac{x\sqrt{2}}{\sqrt{2}}$ Divide each side by $\sqrt{2}$.

$21.2 \approx x$ Use a calculator.

So, $x = a \approx 21.2$ and the perimeter is about 2(21.2)(4) feet, or 169.6 feet.

c. Now, use the formula for the area of a regular polygon.

$A = \frac{1}{2}ap$

$= \frac{1}{2}(21.2)(169.6)$ Substitute.

$= 1797.76$ Simplify.

The area of the deck is about 1798 square feet.

d. Another way to find the area is to use the formula for the area of a square. The length of the side of the deck is 2(21.2), or 42.4.

$A = s^2$

$= 42.4^2$

$= 1797.76$

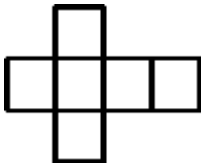
The area of the deck is about 1798 square feet.

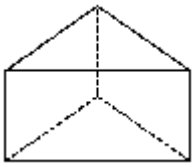
[3] one mathematical error or correct answers with incomplete explanations
[2] two mathematical errors or correct answers with errors in explanation
[1] correct answers with no explanation

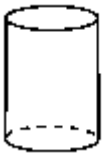
Geometry Semester 2 Review 2013

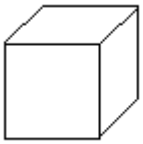
SURFACE AREA
Nets
Prisms
Cylinders
Pyramids
Cones
Spheres
Composite Figures

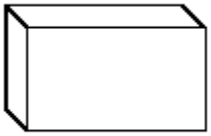
____ 1. Which three-dimensional figure matches this net?



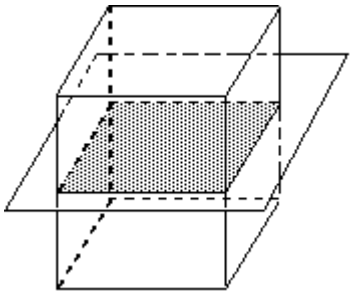
a. 

c. 

b. 

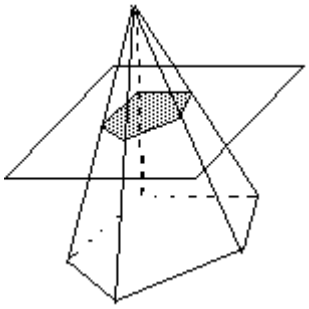
d. 

Describe the cross section.

____ 2. 

a. cube b. trapezoid c. pentagon d. square

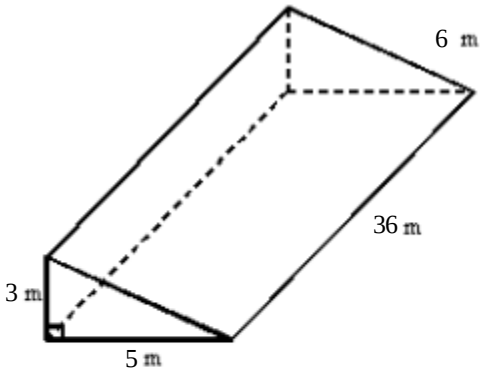
____ 3. Pierre built the model shown in the diagram below for a social studies project. He wants to be able to show the inside of his model, so he sliced the figure as shown. Describe the cross section he created.



a. hexagon b. pentagon c. pyramid d. rectangle

Use formulas to find the lateral area and surface area of the given prism. Show your answer to the nearest whole number.

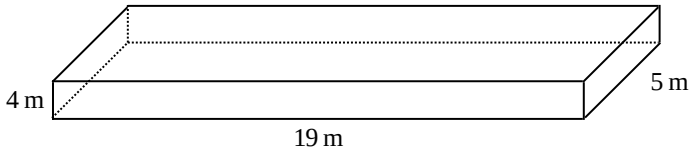
____ 4.



Not drawn to scale

a. 468 m^2; 519 m^2
b. 468 m^2; 534 m^2
c. 504 m^2; 512 m^2
d. 504 m^2; 519 m^2

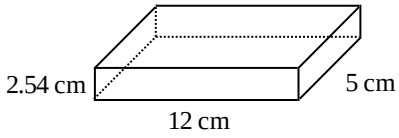
____ 5.



Not drawn to scale

a. 192 m^2; 287 m^2
b. 342 m^2; 287 m^2
c. 192 m^2; 382 m^2
d. 342 m^2; 382 m^2

____ 6. A jewelry store buys small boxes in which to wrap items that they sell. The diagram below shows one of the boxes. Find the lateral area and the surface area of the box to the nearest whole number.

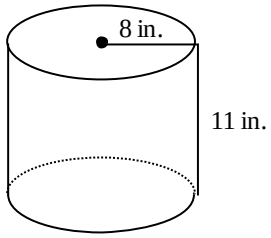


Not drawn to scale

a. 90 cm^2; 146 cm^2
c. 181 cm^2; 206 cm^2
b. 90 cm^2; 206 cm^2
d. 181 cm^2; 146 cm^2

Find the surface area of the cylinder in terms of π.

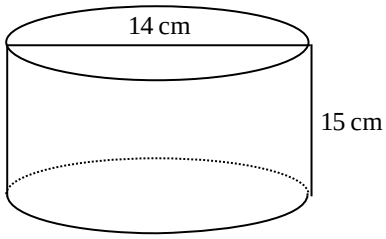
____ 7.



Not drawn to scale

a. 688 $in.^2$
b. 304π $in.^2$
c. 176π $in.^2$
d. 208π $in.^2$

____ 8.



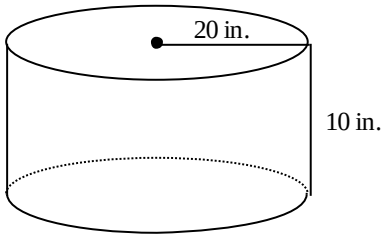
Not drawn to scale

a. 518 cm^2
b. 602π cm^2
c. 812π cm^2
d. 308π cm^2

____ 9. The radius of the base of a cylinder is 28 cm and its height is 48 cm. Find the surface area of the cylinder in terms of π.

a. 4332π cm^2
b. 4256π cm^2
c. 4208π cm^2
d. 4228π cm^2

____ 10. Find the surface area of the cylinder to the nearest whole number.



Not drawn to scale

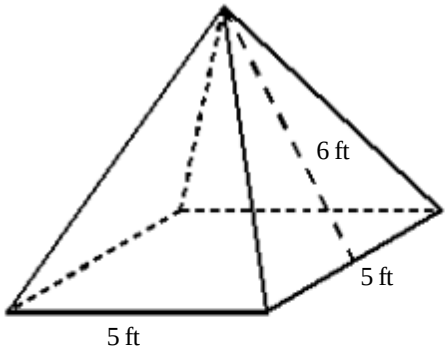
a. 1257 in.^{2} b. 4200 in.^{2} c. 3770 in.^{2} d. 14002 in.^{2}

____ 11. Allison is planning to cover the lateral surface of a large cylindrical garbage can with decorative fabric for a theme party. The can has a diameter of 3 feet and a height of 3.5 feet. How much fabric does she need? Round to the nearest square foot.

a. 123 ft^2 b. 61 ft^2 c. 33 ft^2 d. 66 ft^2

Find the surface area of the pyramid shown to the nearest whole number.

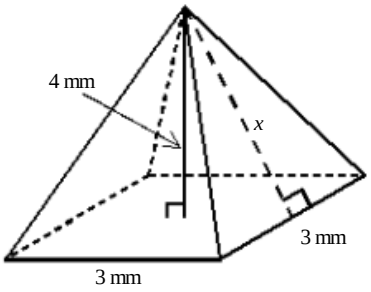
____ 12.



Not drawn to scale

a. 85 ft^2 b. 145 ft^2 c. 60 ft^2 d. 25 ft^2

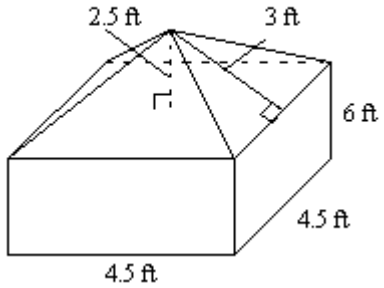
____ 13. Find the slant height x of the pyramid shown to the nearest tenth.



Not drawn to scale

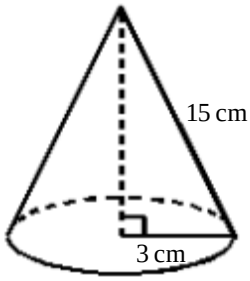
a. 2.4 mm b. 5 mm c. 2.6 mm d. 4.3 mm

____ 14. Find the surface area of the figure to the nearest whole number.



a. 310 ft^2 b. 155 ft^2 c. 135 ft^2 d. 74 ft^2

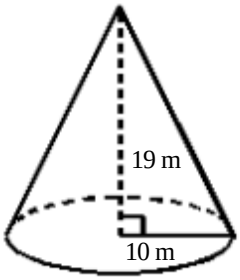
____ 15. Find the surface area of the cone in terms of π.



Not drawn to scale

a. 54π cm^2 b. 99π cm^2 c. 51π cm^2 d. 49.5 cm^2

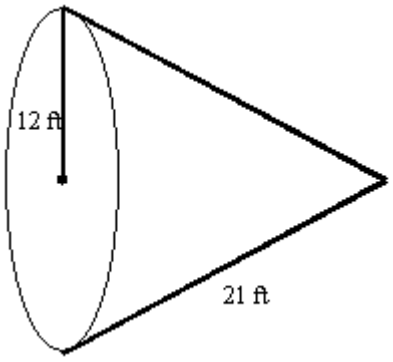
____ 16. Find the slant height of the cone to the nearest whole number.



Not drawn to scale

a. 21 m b. 19 m c. 22 m d. 24 m

____ 17. Find the lateral area and surface area of the cone. Round the answers to the nearest tenth. (The figure is not drawn to scale.)



a. L.A. = 395.8 ft^2 ; S.A. = 791.7 ft^2
c. L.A. = 622.0 ft^2 ; S.A. = 791.7 ft^2
b. L.A. = 1583.4 ft^2 ; S.A. = 1244.1 ft^2
d. L.A. = 791.7 ft^2 ; S.A. = 1244.1 ft^2

____ 18. Find the surface area of a conical grain storage tank that has a height of 30 meters, a diameter of 20 meters, and a slant height of 32 meters. Round the answer to the nearest square meter.

a. 3267 m^2 b. 1319 m^2 c. 2325 m^2 d. 1005 m^2

Find the surface area of the sphere with the given dimension. Leave your answer in terms of π.

____ 19. diameter of 16 cm

a. 256π cm^2 b. 128π cm^2 c. 32π cm^2 d. 1024π cm^2

____ 20. radius of 30 m

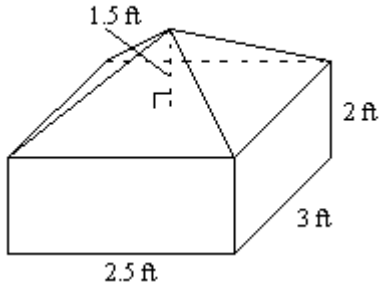
a. $1{,}800\pi$ m^2 b. 900π m^2 c. $3{,}600\pi$ m^2 d. 450π m^2

____ 21. A balloon has a circumference of 23 cm. Use the circumference to approximate the surface area of the balloon to the nearest square centimeter.

a. 1662 cm^2 b. 529 cm^2 c. 168 cm^2 d. 674 cm^2

Other

22. Tyler built a dog house for his chihuahua as shown in the diagram below.
    a. How many square feet of shingles are required to cover the roof?
    b. In order to buy the right amount of paint, Tyler needs to know the surface area of the exterior walls. If one quart covers 30 square feet, how many quarts will he need? Justify your answer.



Geometry Semester 2 Review 2013 – Surface Area
Answer Section

MULTIPLE CHOICE

1. B
2. D
3. B
4. D
5. D
6. C
7. B
8. D
9. B
10. C
11. D
12. A
13. D
14. B
15. A
16. A
17. D
18. B
19. A
20. C
21. C

OTHER

22. To find the surface of the dog house,

Volume of the prism:

V	=	Bh	Use the volume formula for a rectangular prism.
V	=	$(2.5 \cdot 3)(2)$	$B = (2.5 \cdot 3), h = 2$
V	=	15	Simplify.

Volume of the pyramid:

V	=	$\frac{1}{3}Bh$	Use the volume formula for a pyramid.
V	=	$\frac{1}{3}(2.5 \cdot 3)(1.5)$	$B = (2.5 \cdot 3), h = 1.5$
V	=	3.75	Simplify.

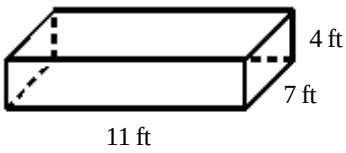
The total volume is 15 ft^3 + 3.75 ft^3, or 18.75 ft^3.

Geometry Semester 2 Review 2013

VOLUME
Prisms
Cylinders
Pyramids
Cones
Spheres
Composite Shapes

Find the volume of the given prism. Round to the nearest tenth if necessary.

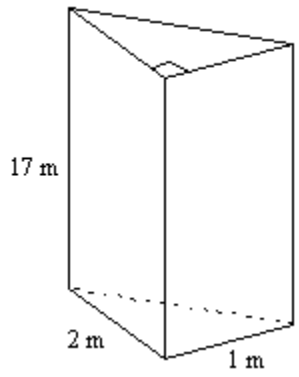
____ 1.



Not drawn to scale

a. 308 ft^3 b. 301 ft^3 c. 298 ft^3 d. 312 ft^3

____ 2.

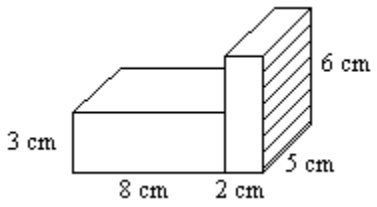


a. 17 m^3 b. 34 m^3 c. 8.5 m^3 d. 1 m^3

____ 3. Concrete can be purchased by the cubic yard. How much will it cost to pour a slab 17 feet by 17 feet by 2 inches for a patio if the concrete costs $40.00 per cubic yard?

a. $1926.67 b. $71.36 c. $214.07 d. $321.11

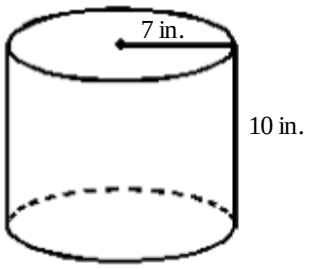
____ 4. Find the volume of the composite space figure to the nearest whole number.



a. 170 cm^3 b. 180 cm^3 c. 120 cm^3 d. 60 cm^3

Find the volume of the cylinder in terms of π.

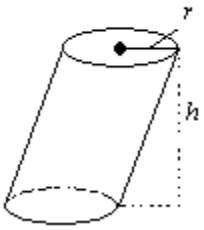
____ 5.



Not drawn to scale

a. 140π in.^{3} b. 490π in.^{3} c. 70π in.^{3} d. 245π in.^{3}

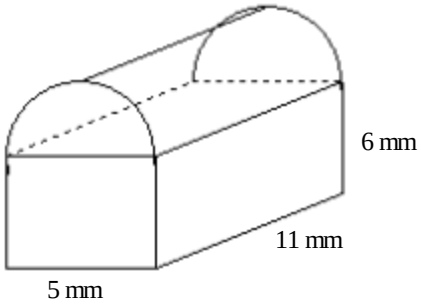
____ 6.



$h = 6$ and $r = 3$

a. 27π in.^{3} b. 108π in.^{3} c. 54π in.^{3} d. 324π in.^{3}

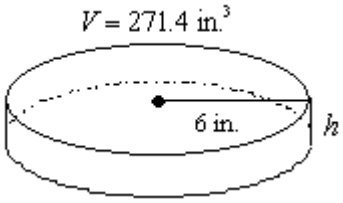
____ 7. Find the volume of the composite space figure to the nearest whole number.



Not drawn to scale

a. 546 mm^3 b. 174 mm^3 c. 364 mm^3 d. 438 mm^3

____ 8. Find the height of the cylinder.

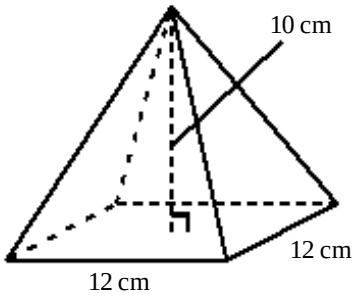


a. 2.4 in. b. 7.2 in. c. 14.4 d. 4.8 in.

____ 9. The volume of a cylinder is 980π in.^{3}. The height of the cylinder is 20 in. What is the radius of the cylinder?
a. 7 in. b. 49 in. c. 327 in. d. 18 in.

Find the volume of the square pyramid shown. Round to the nearest tenth as necessary.

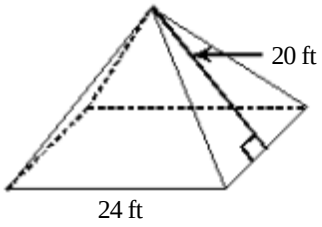
____ 10.



Not drawn to scale

a. 40 cm^3 b. 480 cm^3 c. 147.3 cm^3 d. 720 cm^3

____ 11.



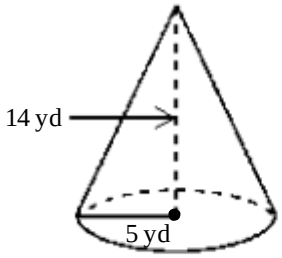
Not drawn to scale

a. 192 ft^3 b. 9216 ft^3 c. 4608 ft^3 d. 3072 ft^3

____ 12. A rectangular pyramid fits exactly on top of a rectangular prism. The prism has length 15 cm, width 5 cm, and height 7 cm, and the pyramid has height 13 cm. Find the volume of the composite space figure.
a. 1500 cm^3 b. 500 cm^3 c. 2275 cm^3 d. 850 cm^3

Find the volume of the cone shown as a decimal rounded to the nearest tenth.

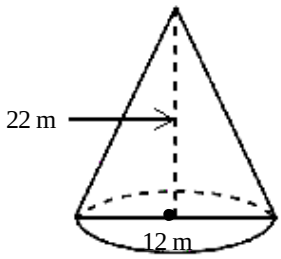
____ 13.



Not drawn to scale

a. 366.5 yd^3 b. 1026.3 yd^3 c. 73.3 yd^3 d. 549.8 yd^3

____ 14.

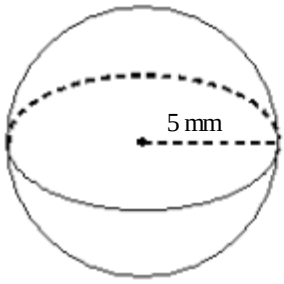


Not drawn to scale

a. 552.9 m^3 b. 829.4 m^3 c. 1,244.1 m^3 d. 3,317.5 m^3

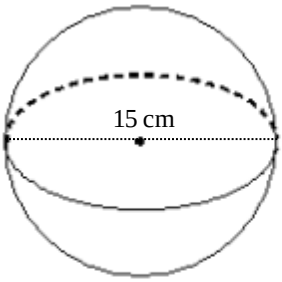
Find the volume of the sphere shown. Give each answer rounded to the nearest cubic unit.

____ 15.



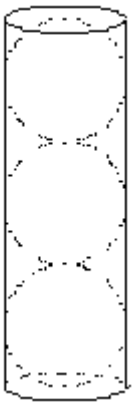
a. 262 mm^3 b. 524 mm^3 c. 314 mm^3 d. 105 mm^3

____ 16.



a. 1,767 cm^3 b. 442 cm^3 c. 236 cm^3 d. 14,137 cm^3

17. Three balls are packaged in a cylindrical container as shown below. The balls just touch the top, bottom, and sides of the cylinder. The diameter of each ball is 13 cm.



a. What is the volume of the cylinder? Explain your method for finding the volume.
b. What is the total volume of the three balls? Explain your method for finding the total volume.

Geometry Semester 2 Review 2013 - Volume
Answer Section

MULTIPLE CHOICE

1. A
2. A
3. B
4. B
5. B
6. C
7. D
8. A
9. A
10. B
11. D
12. D
13. A
14. B
15. B
16. A

OTHER

17.

a. To find the volume of the cylinder, use the formula. You need to use the height and the radius of the cylinder. The radius is the radius of the ball or $13 \text{ cm} \div 2 = 6.5 \text{ cm}$. The height of the cylinder is $13 \text{ cm} \cdot 3 = 39 \text{ cm}$ since 3 balls occupy the cylinder.

V	=	$\pi r^2 h$	Use the formula for the volume of a cylinder.
V	=	$\pi(6.5)^2(39)$	Substitute 6.5 for r and 39 for h.
V	$\approx$	5177	Use a calculator.

The volume of the cylinder is about 5177 cm^3.

b. Use the formula for volume of a sphere to find the volume of one sphere. Then multiply the result by 3.

V	=	$\frac{4}{3}\pi r^3$	Use the formula for the volume of a sphere.
V	=	$\frac{4}{3}\pi(6.5)^3$	Substitute 6.5 for r.
V	$\approx$	1150	Use a calculator.

The volume of the three balls is about $3 \cdot 1150$ cm^3, or 3450 cm^3.