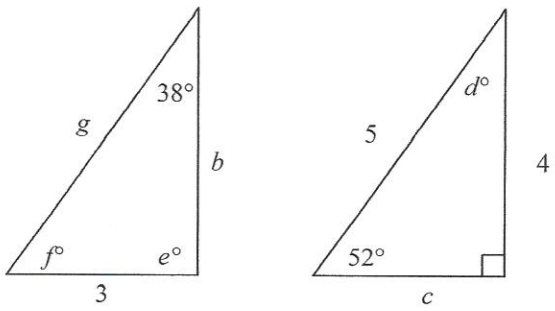
Name: _____ Class: _____ Date: _____ ID: A

Basic Geometry Problems set Week 36 Optional Bonus → ** See bonus points chart

Multiple Choice

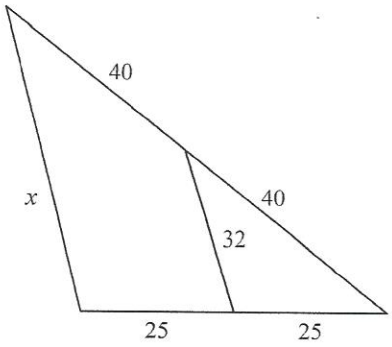
Identify the choice that best completes the statement or answers the question.

____ 1. The two triangles are congruent as suggested by their appearance. Find the value of c. The diagrams are not to scale.



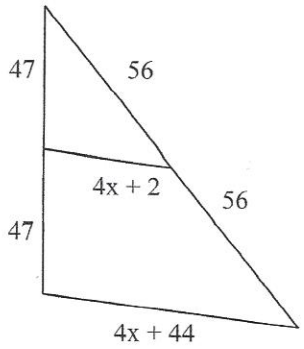
a. 4 b. 5 c. 3 d. 38

____ 2. Find the value of x. The diagram is not to scale.



a. 32 b. 50 c. 64 d. 80

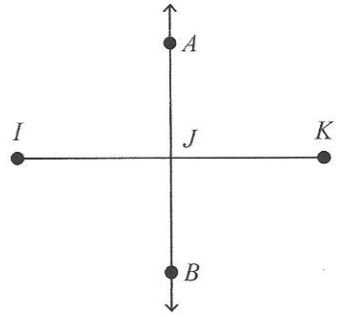
____ 3. Find the length of the midsegment. The diagram is not to scale.



a. 24 b. 0 c. 42 d. 84

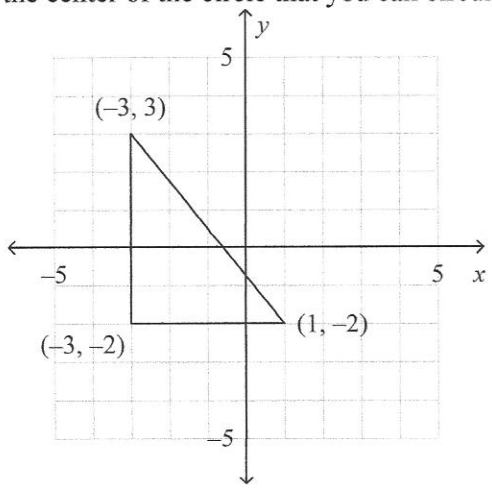
____ 4. Which statement can you conclude is true from the given information?

Given: $\overleftrightarrow{AB}$ is the perpendicular bisector of $\overline{IK}$.



a. $AJ = BJ$
b. $\angle IAJ$ is a right angle.
c. $IJ = JK$
d. A is the midpoint of $\overline{IK}$.

____ 5. Find the center of the circle that you can circumscribe about the triangle.



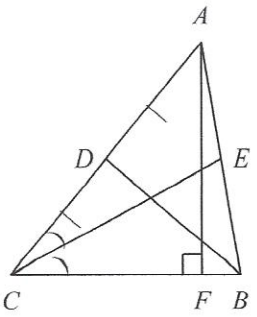
a. $(\frac{1}{2}, -1)$
b. $(-1, \frac{1}{2})$
c. $(-3, \frac{1}{2})$
d. $(-1, -2)$

____ 6. Where is the center of the largest circle that you could draw inside a given triangle?
a. the point of concurrency of the altitudes of the triangle
b. the point of concurrency of the perpendicular bisectors of the sides of the triangle
c. the point of concurrency of the bisectors of the angles of the triangle
d. the point of concurrency of the medians of the triangle

____ 7. Where can the perpendicular bisectors of the sides of a right triangle intersect?
I. inside the triangle
II. on the triangle
III. outside the triangle
a. I only
b. II only
c. I or II only
d. I, II, or II

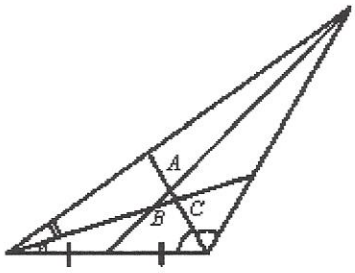
____ 8. Where can the bisectors of the angles of an obtuse triangle intersect?
I. inside the triangle
II. on the triangle
III. outside the triangle
a. I only
b. III only
c. I or III only
d. I, II, or II

____ 9. Name a median for ΔABC.



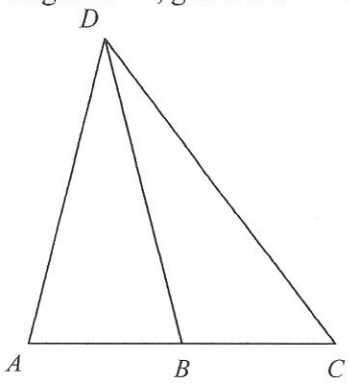
a. $\overline{AD}$ b. $\overline{CE}$ c. $\overline{AF}$ d. $\overline{BD}$

____ 10. Name the point of concurrency of the angle bisectors.



a. A b. B c. C d. not shown

____ 11. Find the length of $\overline{AB}$, given that $\overline{DB}$ is a median of the triangle and $AC = 26$.

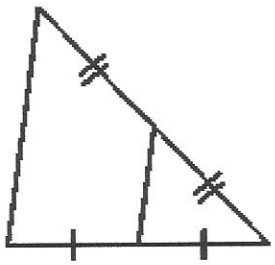


a. 13
b. 26
c. 52
d. not enough information

____ 12. For a triangle, list the respective names of the points of concurrency of
- perpendicular bisectors of the sides
- bisectors of the angles
- medians
- lines containing the altitudes.

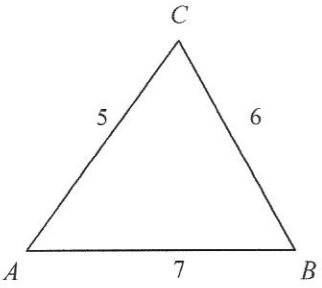
a. incenter, circumcenter, centroid, orthocenter
b. circumcenter, incenter, centroid, orthocenter
c. circumcenter, incenter, orthocenter, centroid
d. incenter, circumcenter, orthocenter, centroid

____ 13. What is the name of the segment inside the large triangle?



a. perpendicular bisector
b. altitude
c. median
d. midsegment

____ 14. Name the smallest angle of ΔABC. The diagram is not to scale.

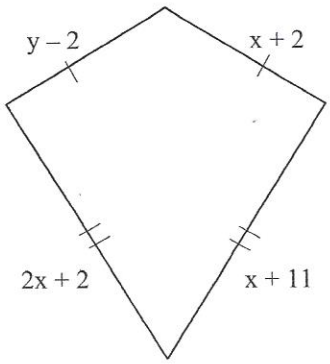


a. $\angle A$
b. $\angle C$
c. Two angles are the same size and smaller than the third.
d. $\angle B$

____ 15. Which three lengths could be the lengths of the sides of a triangle?

a. 12 cm, 5 cm, 17 cm
b. 10 cm, 15 cm, 24 cm
c. 9 cm, 22 cm, 11 cm
d. 21 cm, 7 cm, 6 cm

____ 16. Find the values of the variables and the lengths of the sides of this kite.



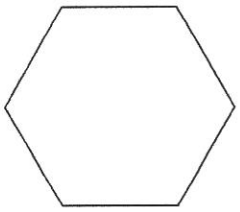
a. $x = 9, y = 13$; 7, 15
b. $x = 13, y = 9$; 7, 15
c. $x = 9, y = 13$; 11, 20
d. $x = 13, y = 9$; 11, 11

____ 17. What is the most precise name for quadrilateral $ABCD$ with vertices $A(-5, 2)$, B(–3, 6), C(6, 6), and $D(4, 2)$?
a. quadrilateral b. rectangle c. parallelogram d. rhombus

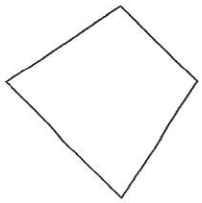
____ 18. Which statement is true?
a. All quadrilaterals are rectangles.
b. All quadrilaterals are squares.
c. All rectangles are quadrilaterals.
d. All quadrilaterals are parallelograms.

____ 19. Judging by appearances, which figure is a trapezoid?

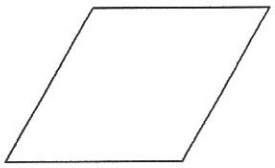
a.



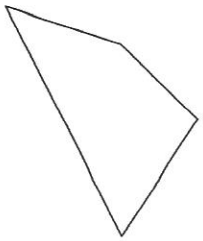
b.



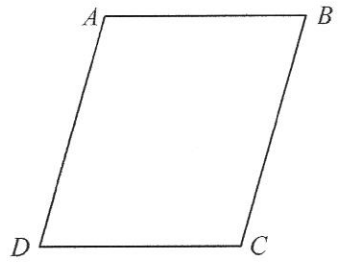
c.



d.

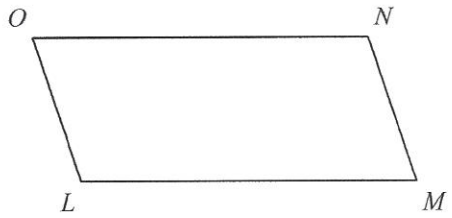


____ 20. $ABCD$ is a parallelogram. If $m\angle CDA = 66$, then $m\angle BCD =$ ___?___. The diagram is not to scale.



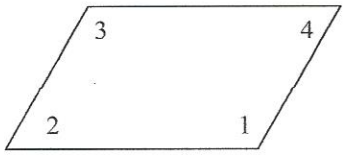
a. 66 b. 124 c. 114 d. 132

____ 21. $LMNO$ is a parallelogram. If $NM = x + 15$ and $OL = 3x + 5$ find the value of x and then find NM and OL.



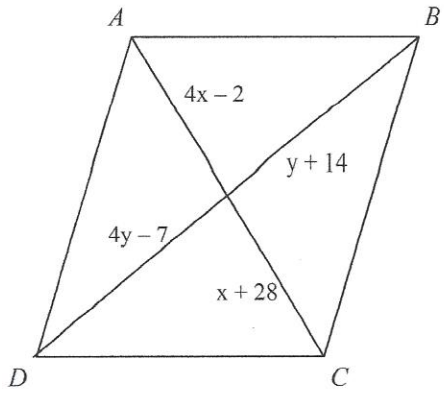
a. $x = 7, NM = 20, OL = 22$
b. $x = 5, NM = 20, OL = 20$
c. $x = 7, NM = 22, OL = 22$
d. $x = 5, NM = 22, OL = 20$

____ 22. 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.



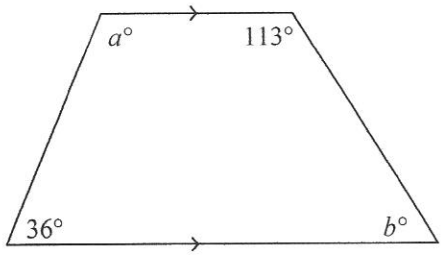
a. 9 b. 17 c. 173 d. 163

____ 23. Find values of x and y for which $ABCD$ must be a parallelogram. The diagram is not to scale.



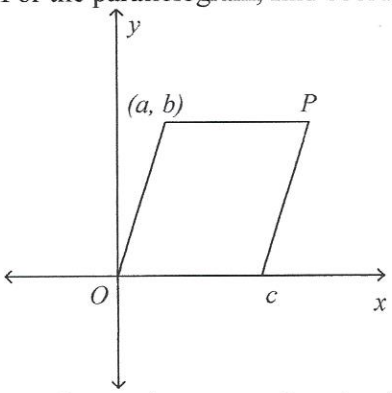
a. $x = 10, y = 38$ b. $x = 10, y = 21$ c. $x = 10, y = 7$ d. $x = 7, y = 10$

____ 24. 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. $a = 113, b = 36$

____ 25. 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)

____ 26. A model is made of a car. The car is 9 feet long and the model is 6 inches long. What is the ratio of the length of the car to the length of the model?

a. 18 : 1
b. 1 : 18
c. 9 : 6
d. 6 : 9

____ 27. If $\frac{a}{b} = \frac{5}{3}$, then $3a =$ ____.

a. $3b$
b. $10b$
c. $5b$
d. $6b$

____ 28. If $\frac{g}{h} = \frac{6}{5}$, which equation must be true?

a. $5h = 6g$
b. $\frac{h}{g} = \frac{5}{6}$
c. $\frac{h}{6} = \frac{g}{5}$
d. $gh = 6 \times 5$

Solve the proportion.

____ 29. $\frac{6}{a} = \frac{18}{27}$

a. 54
b. 81
c. 9
d. 18

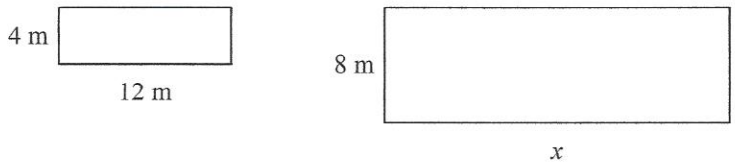
____ 30. $\frac{5}{7} = \frac{m}{35}$

a. $\frac{1}{25}$
b. 5
c. 1
d. 25

____ 31. $\dfrac{3y-8}{12} = \dfrac{y}{5}$

a. -10 b. -7 c. $\dfrac{3}{40}$ d. $\dfrac{40}{3}$

____ 32. The two rectangles are similar. Which is a correct proportion for corresponding sides?



a. $\dfrac{12}{8} = \dfrac{x}{4}$ b. $\dfrac{12}{4} = \dfrac{x}{8}$ c. $\dfrac{12}{4} = \dfrac{x}{20}$ d. $\dfrac{4}{12} = \dfrac{x}{8}$

Are the polygons similar? If they are, write a similarity statement and give the similarity ratio.

____ 33. In ΔRST, $RS = 10$, $RT = 15$, and $m\angle R = 32$. In ΔUVW, $UV = 12$, $UW = 18$, and $m\angle U = 32$.

a. $\Delta RST \sim \Delta WUV; \dfrac{5}{6}$

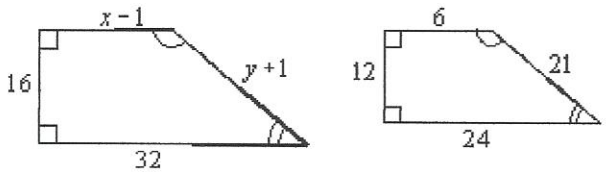
b. $\Delta RST \sim \Delta UVW; \dfrac{5}{6}$

c. $\Delta RST \sim \Delta VWU; \dfrac{6}{5}$

d. The triangles are not similar.

The polygons are similar, but not necessarily drawn to scale. Find the values of x and y.

____ 34.



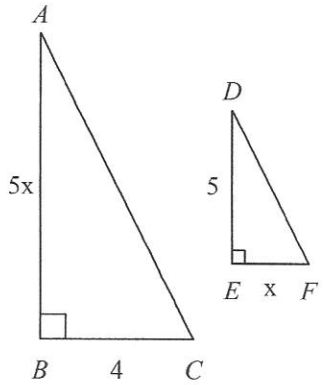
a. $x = \dfrac{11}{2}, y = \dfrac{59}{4}$

b. $x = \dfrac{11}{2}, y = 27$

c. $x = 9, y = \dfrac{59}{4}$

d. $x = 9, y = 27$

____ 35. Triangles *ABC* and *DEF* are similar. Find the lengths of *AB* and *EF*.

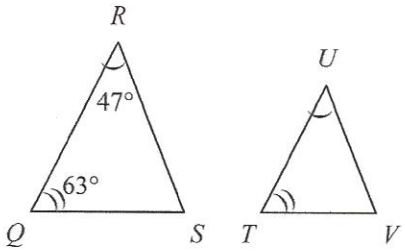


a. $AB = 2$; $EF = 10$
b. $AB = 10$; $EF = 2$
c. $AB = 20$; $EF = 4$
d. $AB = 4$; $EF = 20$

____ 36. You are reducing a map of dimensions 2 ft by 3 ft to fit to a piece of paper 8 in. by 10 in. What are the dimensions of the largest possible map that can fit on the page?

a. $6\frac{2}{3}$ in.by 10 in.
b. $5\frac{1}{3}$ in.by 10 in.
c. 8 in. by $6\frac{2}{3}$ in.
d. 8 in.by 10 in.

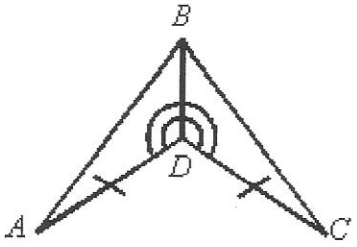
____ 37. $\Delta QRS \sim \Delta TUV$. What is the measure of $\angle V$?



a. 70°
b. 110°
c. 250°
d. 35°

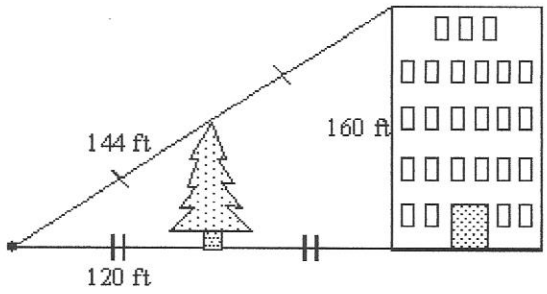
State whether the triangles are similar. If so, write a similarity statement and the postulate or theorem you used.

____ 38.



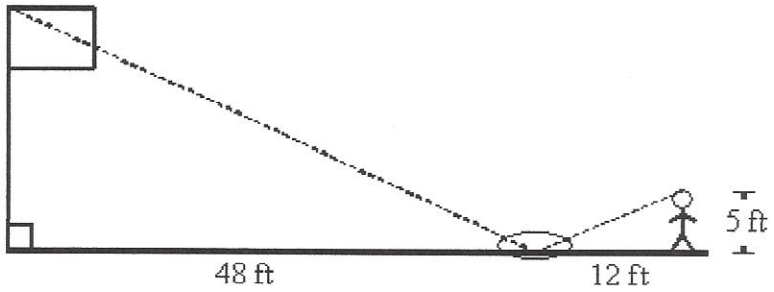
a. $\Delta ADB \sim \Delta CDB$; SAS
b. $\Delta ABD \sim \Delta CDB$; SAS
c. $\Delta ADB \sim \Delta CDB$; SSS
d. The triangles are not similar.

____ 39. Use the information in the diagram to determine the height of the tree to the nearest foot.



a. 80 ft b. 264 ft c. 60 ft d. 72 ft

____ 40. Michele wanted to measure the height of her school's flagpole. She placed a mirror on the ground 48 feet from the flagpole, then walked backwards until she was able to see the top of the pole in the mirror. Her eyes were 5 feet above the ground and she was 12 feet from the mirror. Using similar triangles, find the height of the flagpole to the nearest tenth of a foot.



a. 20 ft b. 38.4 ft c. 55 ft d. 25 ft

Find the geometric mean of the pair of numbers.

____ 41. 175 and 7

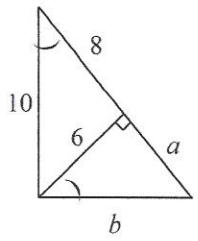
a. 55 b. 45 c. 35 d. 40

____ 42. 5 and 6

a. 30 b. 6 c. $\sqrt{35}$ d. $\sqrt{30}$

Solve for a and b.

____ 43.



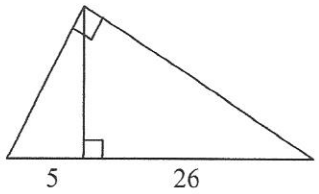
a. $a = \frac{9}{2}, b = \frac{15}{2}$

b. $a = \frac{15}{2}, b = \frac{9}{2}$

c. $a = \frac{16}{3}, b = \frac{15}{2}$

d. $a = \frac{9}{2}, b = \frac{13}{2}$

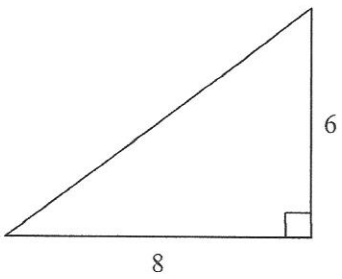
____ 44. Find the length of the altitude drawn to the hypotenuse. The triangle is not drawn to scale.



a. 130 b. $\sqrt{31}$ c. 31 d. $\sqrt{130}$

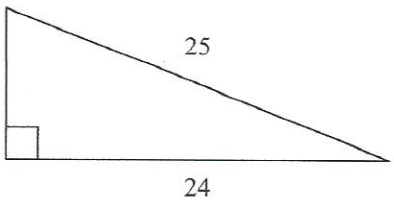
Find the length of the missing side. The triangle is not drawn to scale.

____ 45.



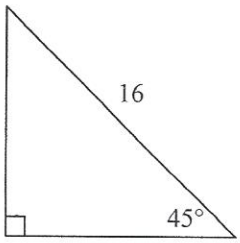
a. 28 b. 100 c. 10 d. 48

____ 46.



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

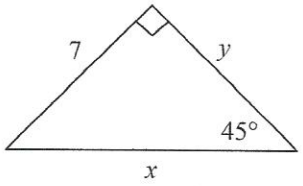
____ 47. Find the length of the leg. If your answer is not an integer, leave it in simplest radical form.



Not drawn to scale

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

____ 48. Find the lengths of the missing sides in the triangle. Write your answers as integers or as decimals rounded to the nearest tenth.

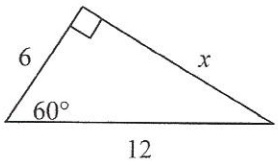


Not drawn to scale

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

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

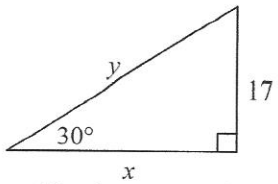
____ 49.



Not drawn to scale

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

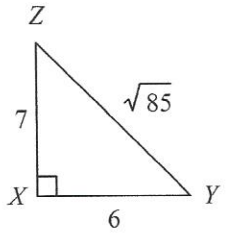
____ 50.



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. $x = 17\sqrt{3}, y = 34$

____ 51. Write the tangent ratios for $\angle Y$ and $\angle Z$.



Not drawn to scale

a. $\tan Y = \frac{6}{7}$; $\tan Z = \frac{7}{6}$

b. $\tan Y = \frac{\sqrt{85}}{7}$; $\tan Z = \frac{\sqrt{85}}{6}$

c. $\tan Y = \frac{7}{6}$; $\tan Z = \frac{6}{7}$

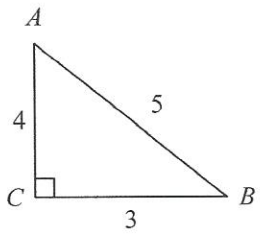
d. $\tan Y = \frac{7}{\sqrt{85}}$; $\tan Z = \frac{6}{\sqrt{85}}$

____ 52. Find the missing value to the nearest tenth.

$\tan \blacksquare = 45$

a. 88.7° b. 77.4° c. 49.4° d. 67.4°

____ 53. Write the ratios for $\sin A$ and $\cos A$.



Not drawn to scale

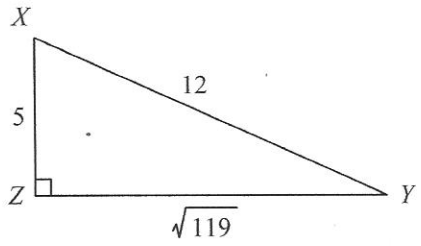
a. $\sin A = \frac{3}{5}, \cos A = \frac{4}{5}$

b. $\sin A = \frac{4}{5}, \cos A = \frac{3}{5}$

c. $\sin A = \frac{3}{4}, \cos A = \frac{4}{5}$

d. $\sin A = \frac{3}{5}, \cos A = \frac{4}{3}$

____ 54. Write the ratios for $\sin X$ and $\cos X$.



a. $\sin X = \frac{\sqrt{119}}{5}, \cos X = \frac{5}{\sqrt{119}}$

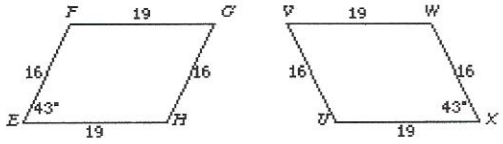
c. $\sin X = \frac{\sqrt{119}}{12}, \cos X = \frac{5}{12}$

b. $\sin X = \sqrt{119}, \cos X = 5$

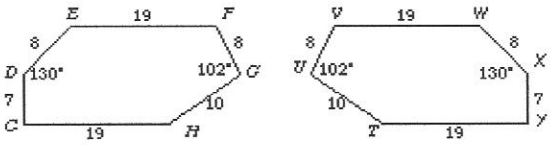
d. $\sin X = \frac{5}{\sqrt{119}}, \cos X = \frac{\sqrt{119}}{5}$

____ 55. Which of these transformations are isometries?

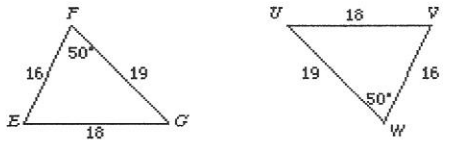
(I) parallelogram $EFGH \rightarrow$ parallelogram $XWVU$



(II) hexagon $CDEFGH \rightarrow$ hexagon $YXWVUT$



(III) triangle $EFG \rightarrow$ triangle VWU



a. I only b. II and III only c. I and III only d. I, II, and III

____ 56. The vertices of a triangle are $P(-2, -4)$, $Q(2, -5)$, and $R(-1, -8)$. Name the vertices of the image reflected in the y-axis.

a. $P'(-2, -4), Q'(2, -5), R'(-1, -8)$

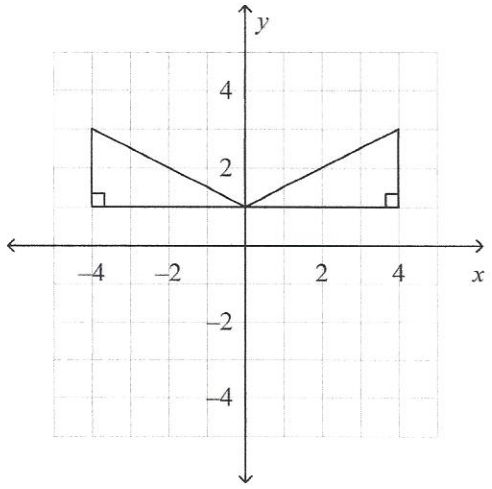
c. $P'(2, -4), Q'(-2, -5), R'(1, -8)$

b. $P'(-2, 4), Q'(2, 5), R'(-1, 8)$

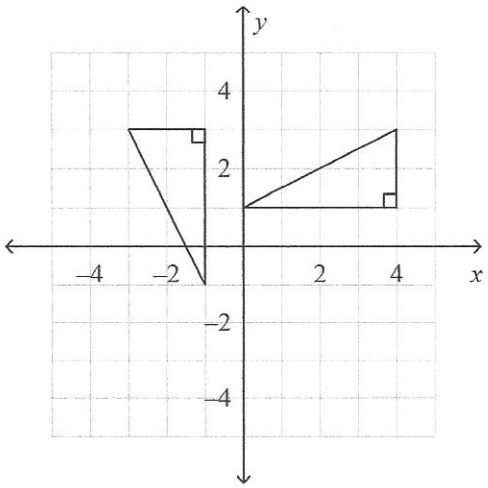
d. $P'(2, 4), Q'(-2, 5), R'(1, 8)$

____ 57. Which graph shows a triangle and its reflection image in the x-axis?

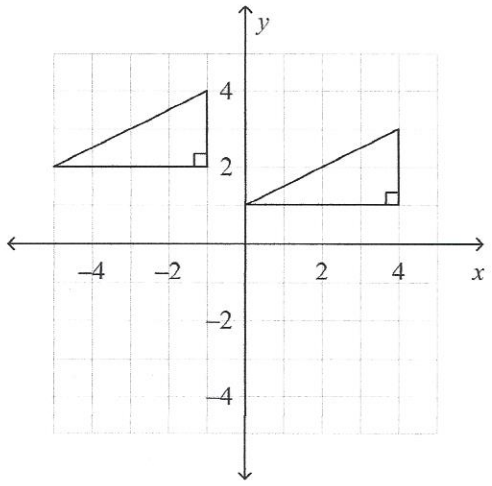
a.



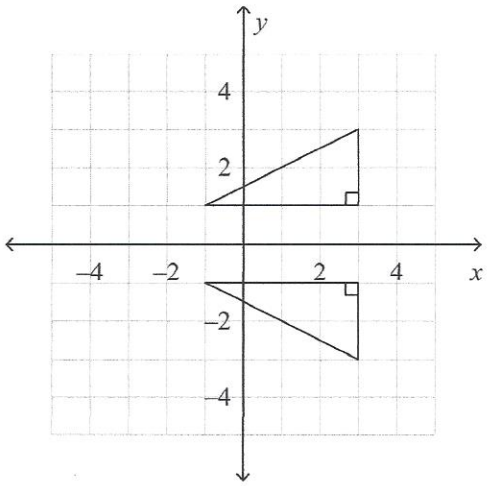
c.



b.



d.



____ 58. Describe in words the translation represented by the vector $\langle 2, -1 \rangle$.

a. 2 units to the right and 1 units down
b. 1 units to the right and 2 units down
c. 2 units to the left and 1 units down
d. 2 units to the left and 1 units up

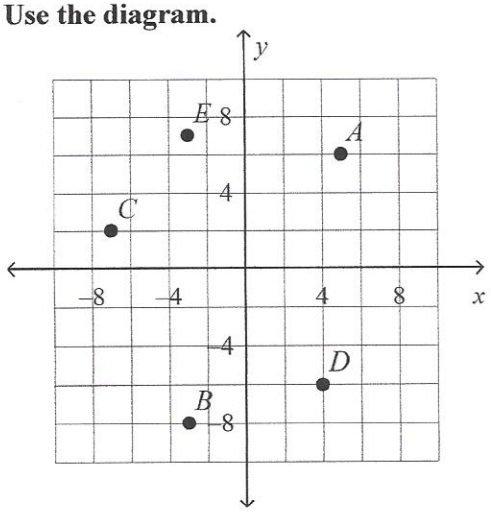
____ 59. Use an ordered pair to describe the translation that is 6 units to the left and 4 units up.

a. $\langle 6, -4 \rangle$ b. $\langle -6, 4 \rangle$ c. $\langle -6, -4 \rangle$ d. $\langle 6, 4 \rangle$

____ 60. Use an ordered pair to describe the translation that is 8 units to the right and 2 units up.

a. $\langle -8, -2 \rangle$ b. $\langle 8, 2 \rangle$ c. $\langle 8, -2 \rangle$ d. $\langle -8, 2 \rangle$

Use the diagram.



____ 61. Find the vector that describes the translation $B \rightarrow A$.

a. $\langle 8, 14 \rangle$ b. $\langle 7, 2 \rangle$ c. $\langle -4, 10 \rangle$ d. $\langle 0, 15 \rangle$

____ 62. Write a rule to describe the transformation that is a reflection in the x-axis.

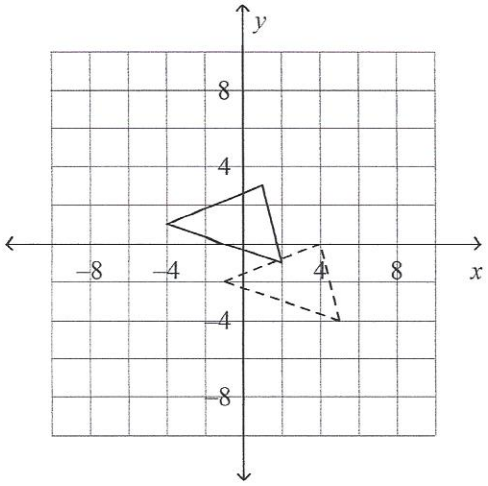
a. $(x, y) \rightarrow (y, x)$
b. $(x, y) \rightarrow (-x, y)$
c. $(x, y) \rightarrow (-x, -y)$
d. $(x, y) \rightarrow (x, -y)$

____ 63. Write a rule to describe the transformation that is a reflection in the y-axis.

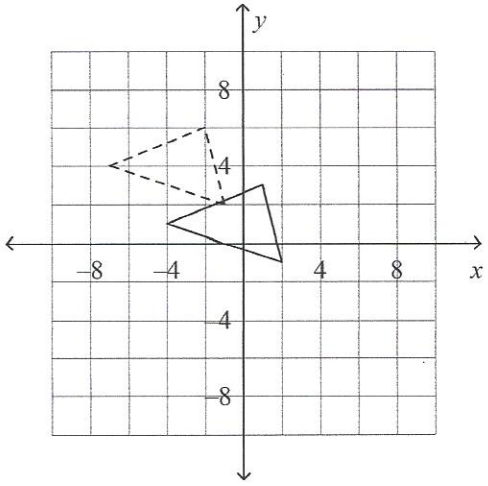
a. $(x, y) \rightarrow (x, -y)$
b. $(x, y) \rightarrow (-x, y)$
c. $(x, y) \rightarrow (-x, -y)$
d. $(x, y) \rightarrow (y, x)$

____ 64. Which translation from solid-lined figure to dashed-lined figure is given by the vector $\langle -3, 3 \rangle$?

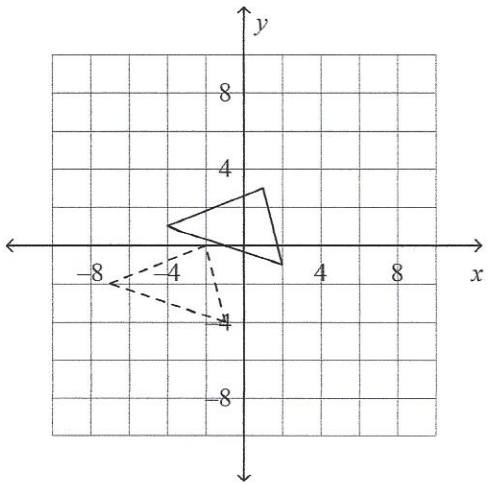
a.



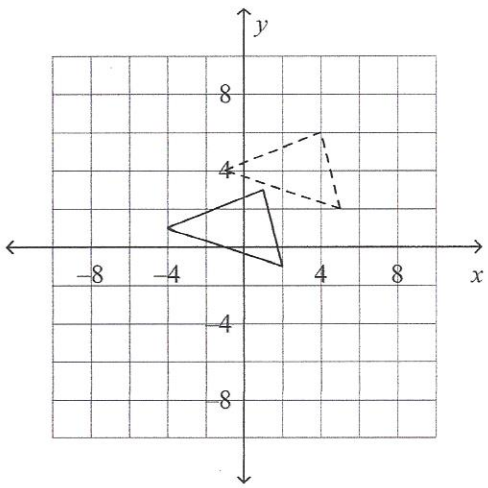
c.



b.

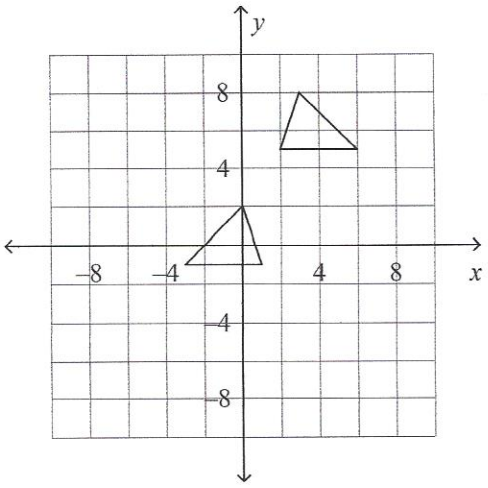


d.

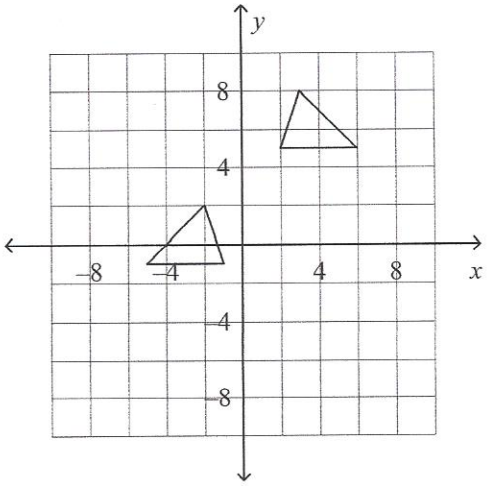


____ 65. Find the glide reflection image of the solid triangle for the glide of $\langle -8, -7 \rangle$ and reflection line $x = -3$.

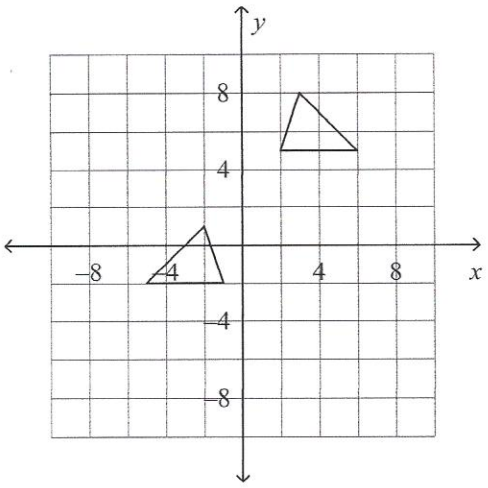
a.



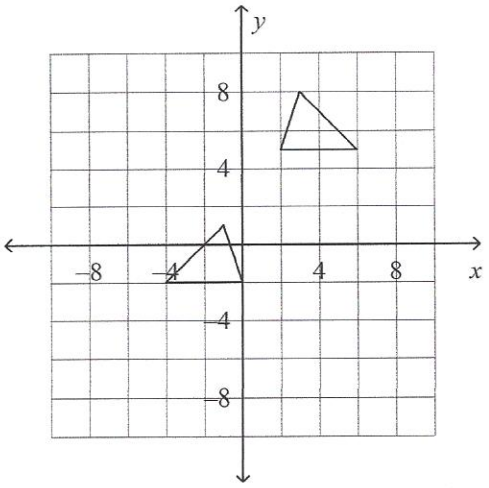
c.



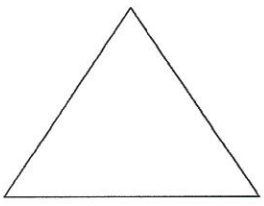
b.



d.



____ 66. How many lines of symmetry does the figure have?

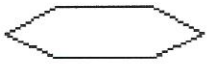


a. 3 b. 2 c. 1 d. 0

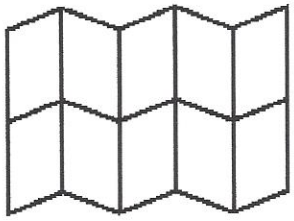
____ 67. Which letter has at least one line of symmetry?

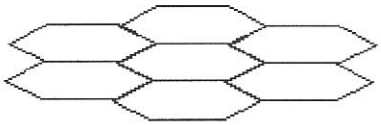
a. F b. W c. Z d. S

____ 68. Which drawing is the tessellation of the figure?



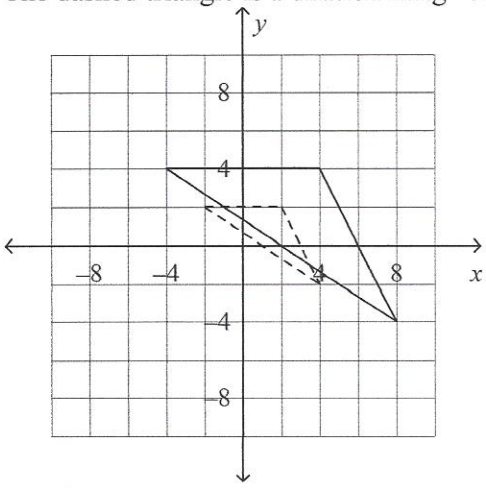
a. 

c. 

b. 

d. none of these

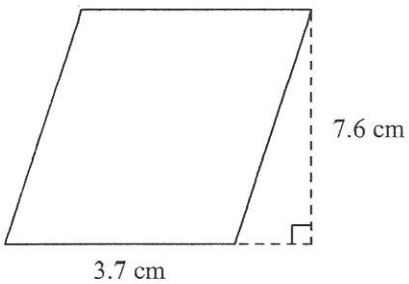
____ 69. The dashed triangle is a dilation image of the solid triangle. What is the scale factor?



a. $\frac{1}{4}$ b. $\frac{1}{2}$ c. $\frac{2}{3}$ d. 2

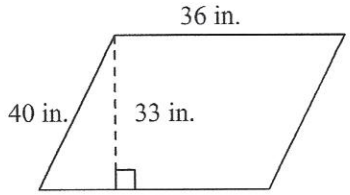
Find the area. The figure is not drawn to scale.

____ 70.



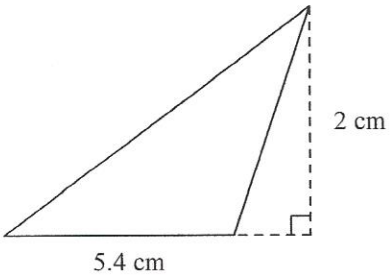
a. 28.12 cm^2 b. 3.9 cm^2 c. 11.3 cm^2 d. 56.24 cm^2

____ 71.



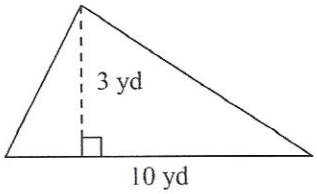
a. 1188 in.^{2} b. 69 in.^{2} c. 138 in.^{2} d. 1440 in.^{2}

____ 72.



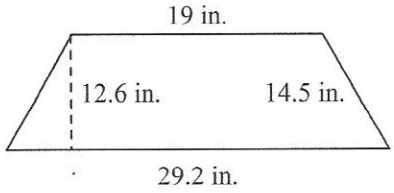
a. 10.8 cm^2 b. 5.4 cm^2 c. 21.6 cm^2 d. 7.4 cm^2

____ 73.



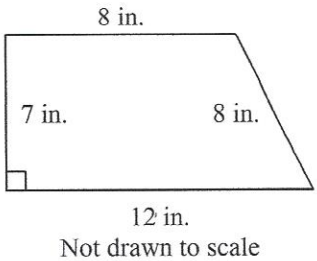
a. 30 yd^2 b. 6.5 yd^2 c. 13 yd^2 d. 15 yd^2

____ 74.



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

____ 75.



Not drawn to scale

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

____ 76. 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

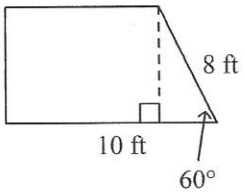
Find the area of a parallelogram with the given vertices.

____ 77. $P(1, 3)$, $Q(3, 3)$, $R(7, 8)$, $S(9, 8)$
a. 10 units^2 b. 5 units^2 c. 20 units^2 d. none of these

____ 78. $P(-2, -5)$, $Q(9, -5)$, $R(1, 5)$, $S(12, 5)$
a. 110 units^2 b. 55 units^2 c. 220 units^2 d. none of these

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

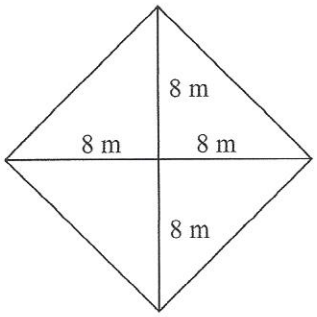
____ 79.



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

____ 80. Find the area of the rhombus.

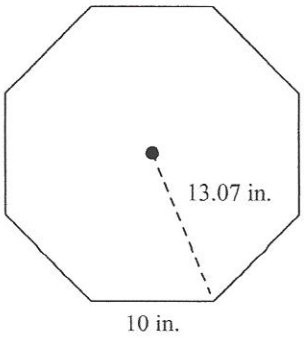


a. 12 m^2 b. 4096 m^2 c. 128 m^2 d. 32 m^2

____ 81. 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

____ 82. 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

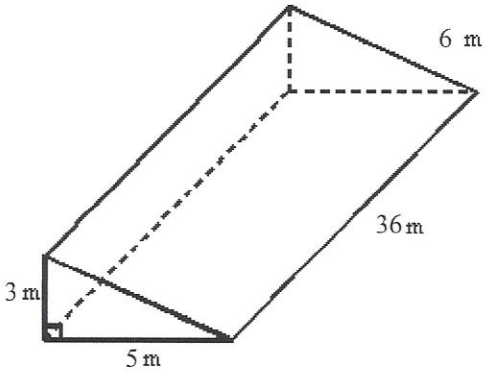
____ 83. Find the area of the regular polygon. Round your answer to the nearest tenth.



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

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

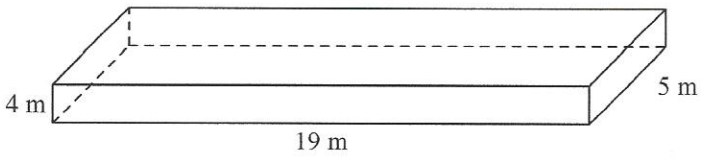
____ 84.



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

____ 85.

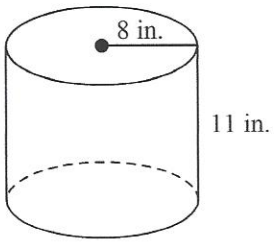


Not drawn to scale

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

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

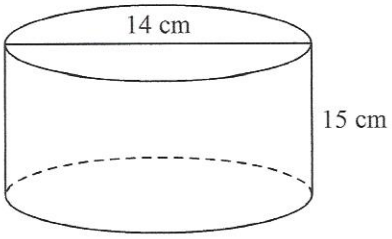
____ 86.



Not drawn to scale

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

____ 87.

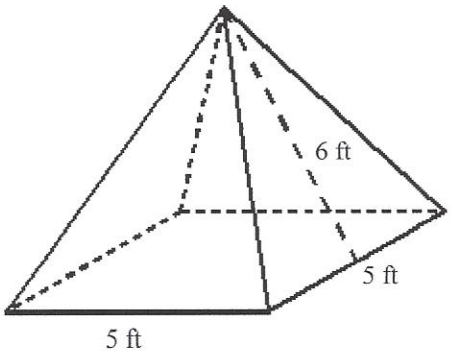


Not drawn to scale

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

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

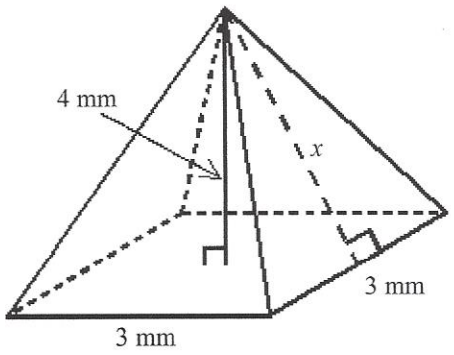
____ 88.



Not drawn to scale

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

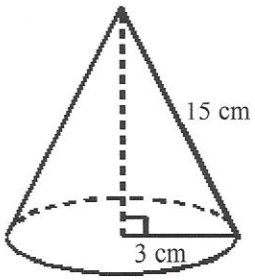
____ 89. Find the slant height x of the pyramid shown to the nearest tenth.



Not drawn to scale

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

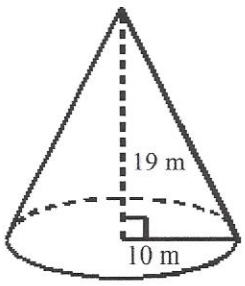
____ 90. Find the surface area of the cone in terms of π.



Not drawn to scale

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

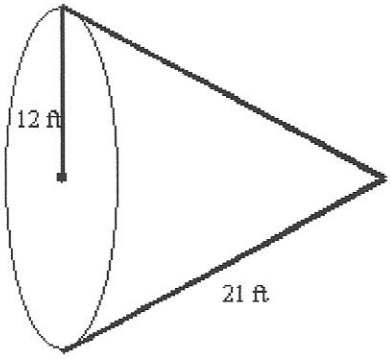
____ 91. Find the slant height of the cone to the nearest whole number.



Not drawn to scale

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

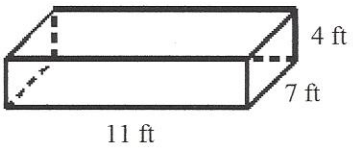
____ 92. Find the lateral area and surface area of the cone. Round the answers to the nearest tenth. (The figure is not drawn to scale.)



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

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

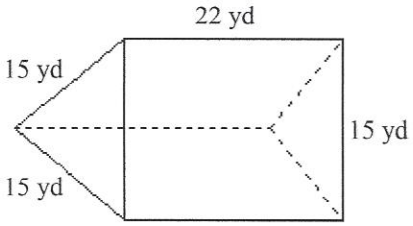
____ 93.



Not drawn to scale

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

____ 94.

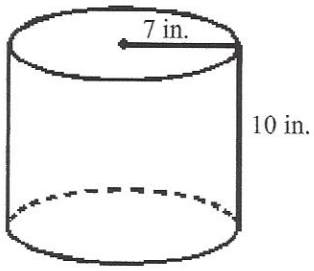


Not drawn to scale

a. 2143.4 yd^3
b. 1750.1 yd^3
c. 4286.8 yd^3
d. 2475.0 yd^3

Find the volume of the cylinder in terms of π.

___ 95.

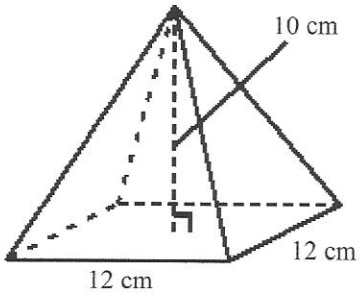


Not drawn to scale

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

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

___ 96.

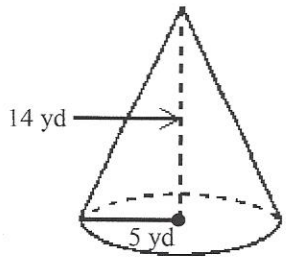


Not drawn to scale

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

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

___ 97.

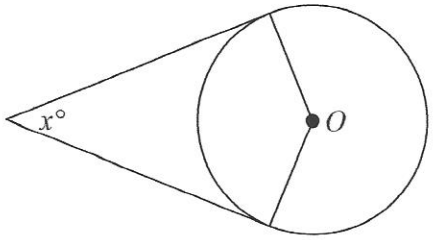


Not drawn to scale

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

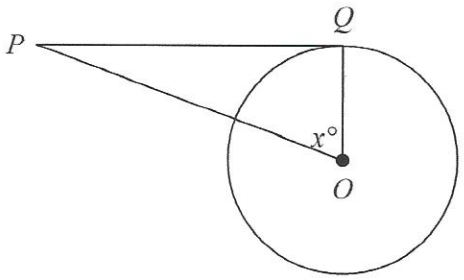
Assume that lines that appear to be tangent are tangent. *O* is the center of the circle. Find the value of *x*. (Figures are not drawn to scale.)

____ 98. $m\angle O = 111$



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

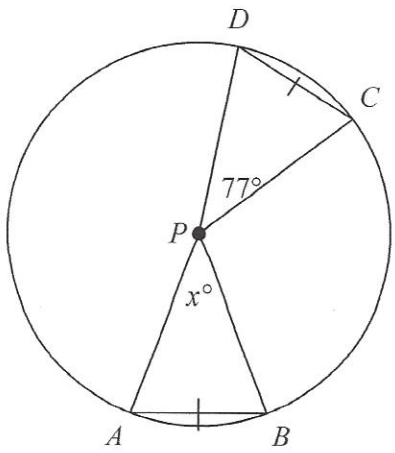
____ 99. $m\angle P = 12$



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

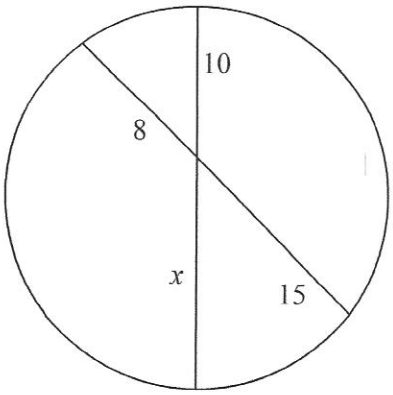
Find the value of *x*. If necessary, round your answer to the nearest tenth. The figure is not drawn to scale.

____ 100.



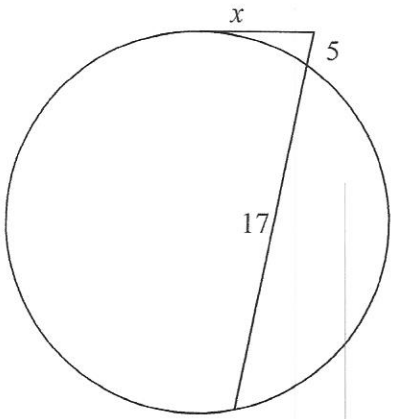
a. 13 b. 26 c. 77 d. 38.5

____ 101.



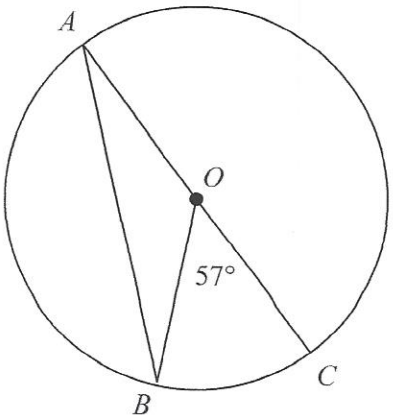
a. 18.8 b. 120 c. 5.3 d. 12

____ 102.



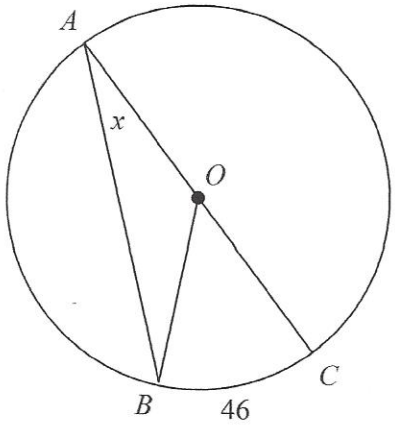
a. 19.34 b. 10.49 c. 110 d. 9.22

____ 103. Find the measure of $\angle BAC$. (The figure is not drawn to scale.)



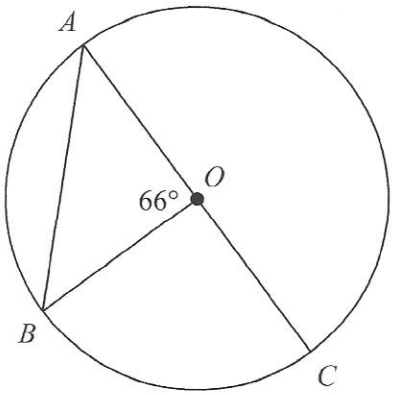
a. 57 b. 28.5 c. 33 d. 114

____ 104. Find x. (The figure is not drawn to scale.)



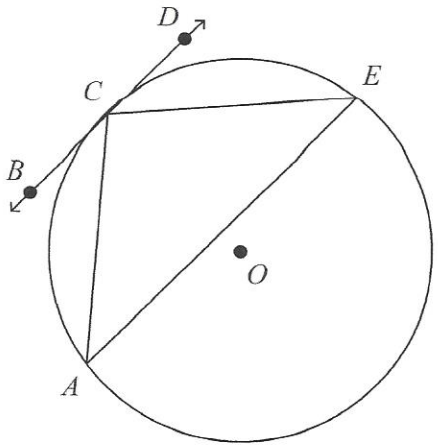
a. 92 b. 44 c. 23 d. 46

____ 105. Find $m\angle BAC$. (The figure is not drawn to scale.)



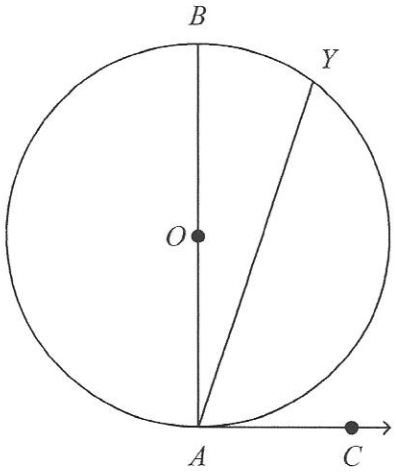
a. 114 b. 57 c. 132 d. 33

____ 106. $\overleftrightarrow{BD}$ is tangent to circle O at C, $m(\text{arc } AEC) = 279$, and $m\angle ACE = 85$. Find $m\angle DCE$. (The figure is not drawn to scale.)



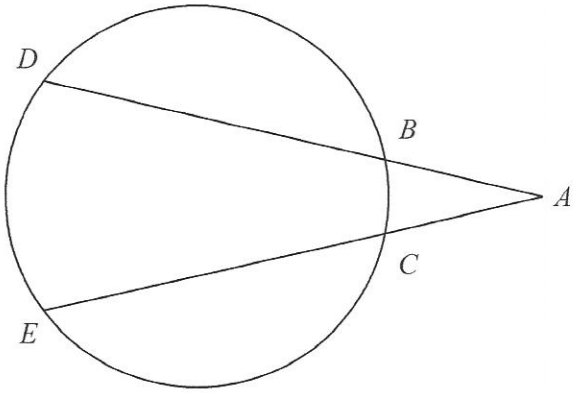
a. 109 b. 97 c. 54.5 d. 48.5

____ 107. If $m(\text{arc } BY) = 40$, what is $m\angle YAC$? (The figure is not drawn to scale.)



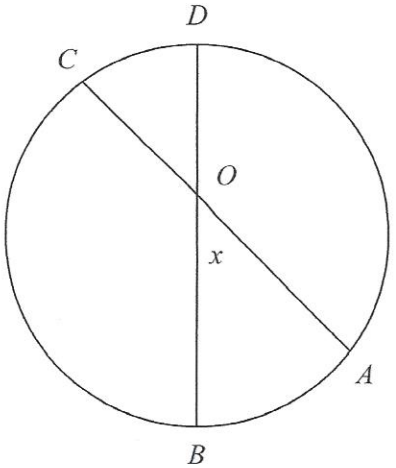
a. 140 b. 100 c. 70 d. 80

____ 108. $m(\text{arc } DE) = 96$ and $m(\text{arc } BC) = 67$. Find $m\angle A$. (The figure is not drawn to scale.)



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

____ 109. Find the value of x for $m(\text{arc } AB) = 46$ and $m(\text{arc } CD) = 25$. (The figure is not drawn to scale.)



a. 35.5° b. 58.5° c. 71° d. 21°