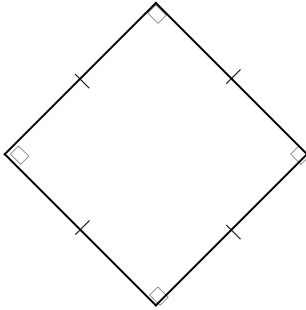# Geometry Final Exam Review

Multiple Choice
*Identify the letter of the choice that best completes the statement or answers the question.*

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

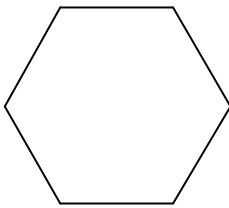_____ 3. Which Venn diagram is NOT correct?
   a.   c.
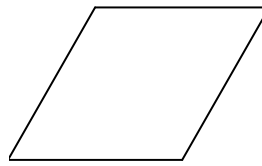
b.

Squares

Rectangles

d.

Parallelograms

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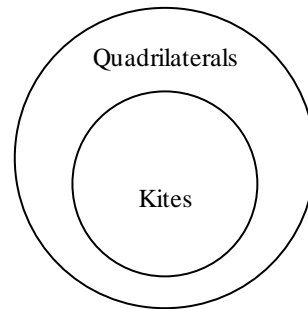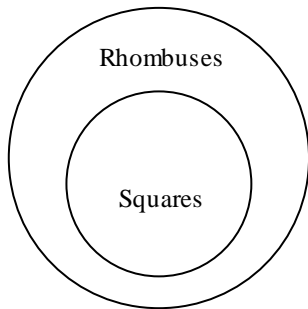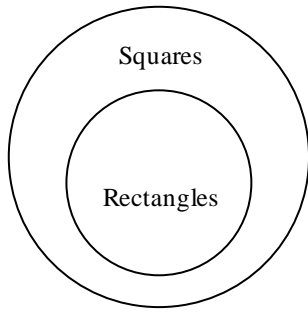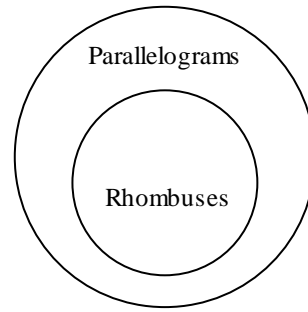
_____ 4. Judging by appearances, which figure is a trapezoid?
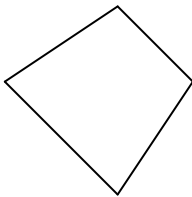
a.

c.

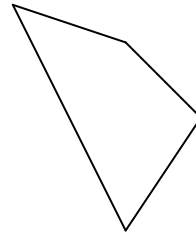b.

d.

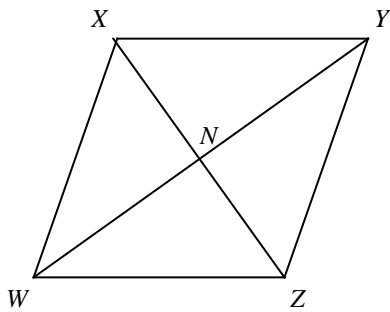_____ 5. *WXYZ* is a parallelogram. Name an angle congruent to $\angle WZY$.

X   Y

N

W   Z

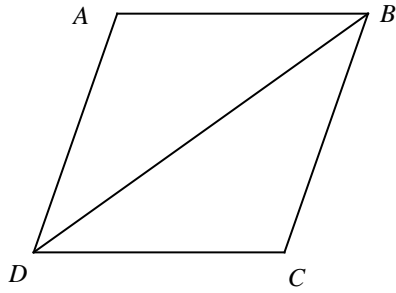a. $\angle ZXY$ b. $\angle XWZ$ c. $\angle ZXW$ d. $\angle WXY$

_____ 6. What is the missing reason in the proof?

Given: parallelogram *ABCD* with diagonal $\overline{BD}$
**Prove:** $\triangle ABD \cong \triangle CDB$

Statements	Reasons
1. $\overline{AD} \parallel \overline{BC}$	1. Definition of parallelogram
2. $\angle ADB \cong \angle CBD$	2. Alternate Interior Angles Theorem
3. $\overline{AB} \parallel \overline{CD}$	3. Definition of parallelogram
4. $\angle ABD \cong \angle CDB$	4. Alternate Interior Angles Theorem
5. $\overline{DB} \cong \overline{DB}$	5. Reflexive Property of Congruence
6. $\triangle ABD \cong \triangle CDB$	6. ?

a. Reflexive Property of Congruence c. Alternate Interior Angles Theorem
b. ASA   d. SSS

_____ 7. Based on the information given, can you determine that the quadrilateral must be a parallelogram? Explain.

**Given:** $\overline{XY} \cong \overline{WZ}$ and $\overline{XW} \cong \overline{YZ}$
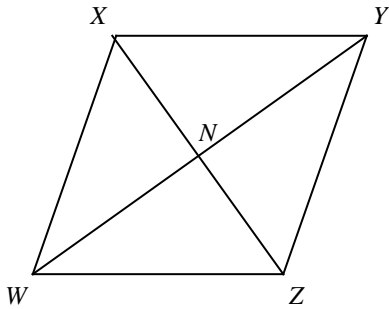
a. No; you cannot determine that the quadrilateral is a parallelogram.
b. Yes; two opposite sides are both parallel and congruent.
c. Yes; opposite sides are congruent.
d. Yes; diagonals of a parallelogram bisect each other.

_____ 8. Which statement can you use to conclude that quadrilateral *XYZW* is a parallelogram?
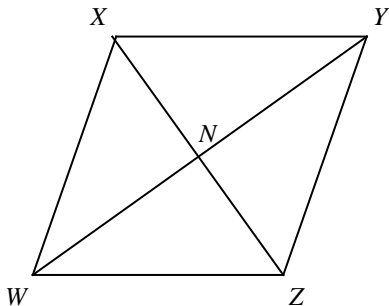
a. $\overline{XW} \cong \overline{YZ}$ and $\overline{XY} \cong \overline{WZ}$ c. $\overline{YN} = \overline{NX}$ and $\overline{XN} = \overline{NY}$

b. $\overline{XW} \cong \overline{WZ}$ and $\overline{XY} \cong \overline{WZ}$ d. $\overline{XW} \cong \overline{YZ}$ and $\overline{XY} \cong \overline{YZ}$

_____ 9. 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.
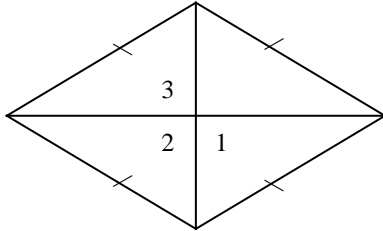
a. $x = 12$, $y = 84$, $z = 20$ c. $x = 6$, $y = 84$, $z = 10$

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

_____ 10. Lucinda wants to build a square sandbox, but has no way of measuring angles. Explain how she can make sure that the sandbox is square by only measuring length.
   a. Arrange four equal-length sides so the diagonals bisect each other.
   b. Arrange four equal-length sides so the diagonals are equal lengths also.
   c. Make each diagonal the same length as four equal-length sides.
   d. Not possible; Lucinda has to be able to measure a right angle.

_____ 11. 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

_____ 12. 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

_____ 13. In quadrilateral $MNOP$, $\angle M \cong \angle N$. Which of a parallelogram, trapezoid, or rhombus could quadrilateral $MNOP$ be?
   a. parallelogram or rhombus   c. trapezoid only
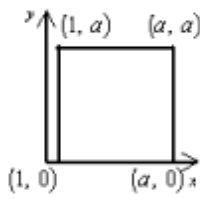   b. parallelogram only   d. any of the three

_____ 14. For the parallelogram, find coordinates for P without using any new variables.
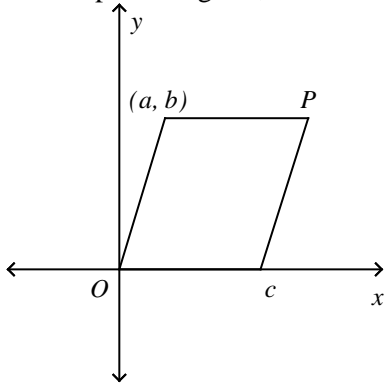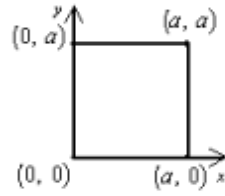

a. $(a - c, c)$ b. (c, a) c. $(a + c, b)$ d. (c, b)

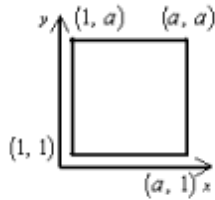_____ 15. Which diagram shows the most useful positioning of a square in the first quadrant of a coordinate plane?
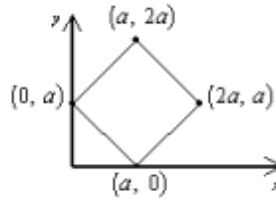
a.

(1, a) (a, a)

(1, 0) (a, 0) x

b.

(1, a) (a, a)

(1, 1)

(a, 1) x

c.

(0, a) (a, a)
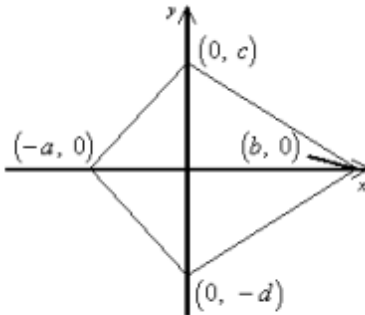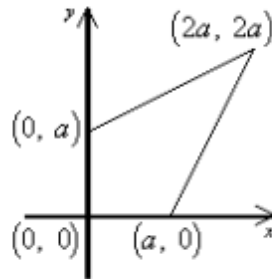
(0, 0) (a, 0) x

d.

(a, 2a)

(0, a) (2a, a)

(a, 0)

_____ 16. Which diagram shows the most useful positioning and accurate labeling of a kite in the coordinate plane?

a.

(0, c)

(-a, 0) (b, 0)

(0, -d)
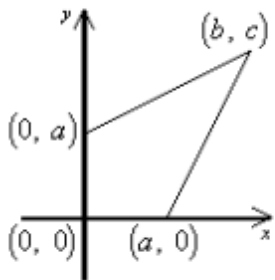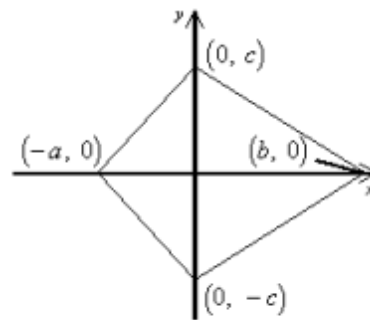
c.

(2a, 2a)

(0, a)

(0, 0) (a, 0)

b.

(b, c)

(0, a)

(0, 0) (a, 0)

d.

(0, c)

(-a, 0) (b, 0)

(0, -c)

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

_____ 17.

36 in.

40 in. 33 in.
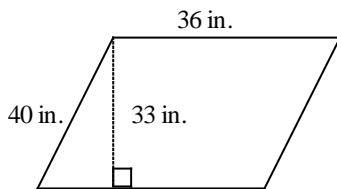
a. 1188 in.^{2} b. 69 in.^{2} c. 138 in.^{2} d. 1440 in.^{2}

____ 18. 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?

7.2 ft

12.9 ft

25 ft

Not drawn to scale

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

____ 19. A fly lands at random at a point on the grid. Find the probability of the fly landing on the figure.

a. $\dfrac{9}{35}$	b. $\dfrac{9}{70}$	c. $\dfrac{18}{70}$	d. $\dfrac{9}{61}$

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

____ 20.

8 m

7 m

Not drawn to scale

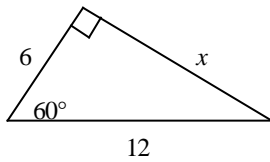| a. $\sqrt{17}$ m	b. 113 m	c. $\sqrt{113}$ m	d. $\sqrt{71}$ m

_____ 21.

15

6

Not drawn to scale

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

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

_____ 22.

6   x

60°

12

Not drawn to scale

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

_____ 23. 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

_____ 24. 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?
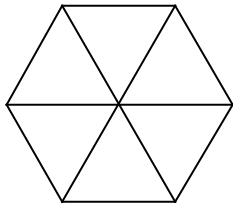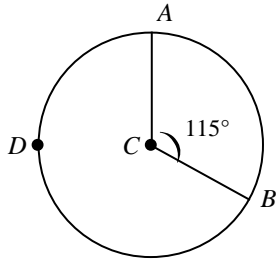

7 cm

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

_____ 25. 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

_____ 26. Name the minor arc and find its measure.

a.   arc *ADB;* 30°   b.   arc *AB;* 115°   c.   arc *ADB;* 245°   d.   arc *AB;* 245°

____ 27. 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

____ 28. Find the area of the triangle. Leave your answer in simplest radical form.
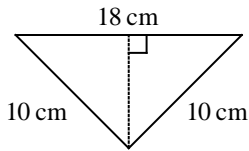
a. $94\sqrt{14}$ cm^2 b. $18\sqrt{19}$ cm^2 c. $184\sqrt{14}$ cm^2 d. $9\sqrt{19}$ cm^2

____ 29. If $\dfrac{g}{h} = \dfrac{6}{5}$, which equation must be true?

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

____ 30. If $\dfrac{x+3}{3} = \dfrac{y+2}{2}$, then $\dfrac{x}{3} =$ ____.

a. $y + 1$ b. $\dfrac{y}{3}$ c. $\dfrac{y}{2}$ d. $y - 1$

____ 31. Solve the extended proportion $\dfrac{x}{9} = \dfrac{4}{y} = \dfrac{y}{36}$ for *x* and *y* with $x > 0$ and $y > 0$.

a. $x = 6; y = 6$ c. $x = 3; y = 12$
b. $x = 2; y = 18$ d. $x = 8; y = 24$

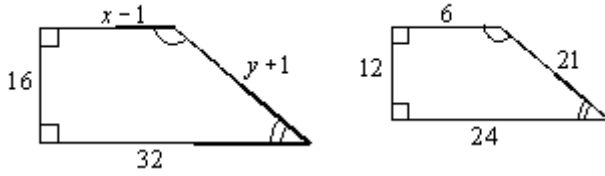____ 32. The two rectangles are similar. Which is a correct proportion for corresponding sides?
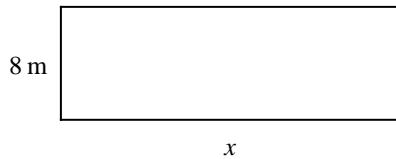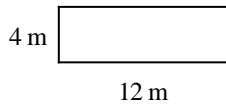
a. $\dfrac{12}{8} = \dfrac{x}{4}$ b. $\dfrac{12}{4} = \dfrac{x}{8}$ c. $\dfrac{12}{4} = \dfrac{x}{20}$ d. $\dfrac{4}{12} = \dfrac{x}{8}$

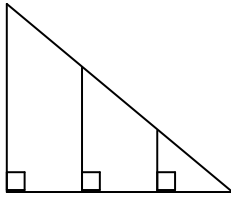**The polygons are similar, but not necessarily drawn to scale. Find the values of x and y.**

_____ 33.

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

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

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

d. $x = 9,\ y = 27$

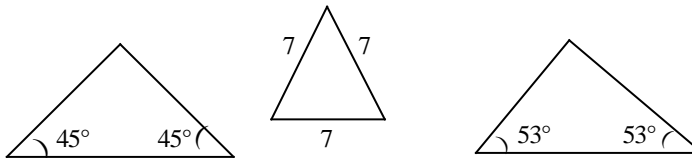_____ 34. If one measurement of a golden rectangle is 8.8 inches, which could be the other measurement?
   a. 14.238 in.   b. 10.418 in.   c. 7.182 in.   d. 1.618 in.
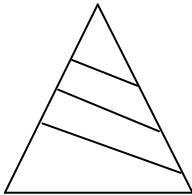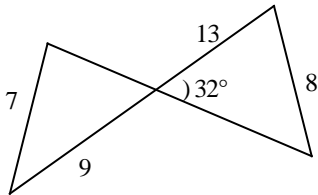
_____ 35. Which group contains triangles that are all similar?
   a.

   b.

   c.

   d.

State whether the triangles are similar. If so, write a similarity statement and the postulate or theorem you used.
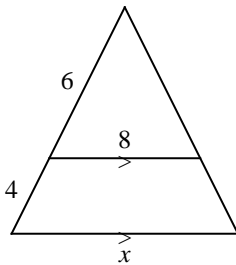
_____ 36.
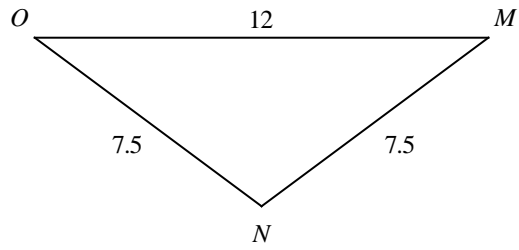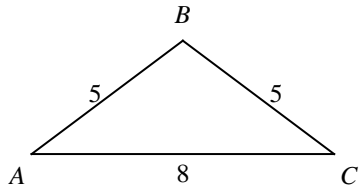
a. $\triangle ABC \sim \triangle MNO$; SSS
b. $\triangle ABC \sim \triangle MNO$; SAS

c. $\triangle ABC \sim \triangle MNO$; AA
d. The triangles are not similar.

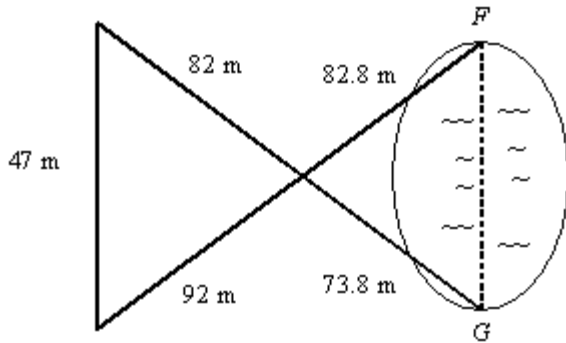**Explain why the triangles are similar. Then find the value of x.**

_____ 37.

Not drawn to scale

a. SSS Postulate; $5\frac{1}{3}$

c. SAS Postulate; $13\frac{1}{3}$

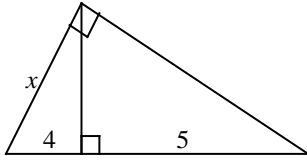b. AA Postulate; $13\frac{1}{3}$

d. AA Postulate; $5\frac{1}{3}$

_____ 38. Campsites F and G are on opposite sides of a lake. A survey crew made the measurements shown on the diagram. What is the distance between the two campsites? The diagram is not to scale.

a. 42.3 m
b. 47.4 m
c. 73.8 m
d. 82.8 m

Solve for x.

_____ 39.

Not drawn to scale

a. 20   b. 6   c. $2\sqrt{5}$ d. 9

The figures are similar. The area of one figure is given. Find the area of the other figure to the nearest whole number.

_____ 40. A rectangular napkin costs $3.25. A similar tablecloth is five times longer and five times wider. How much would you expect to pay for the tablecloth?
a. $81.25   b. $48.75   c. $16.25   d. $32.50
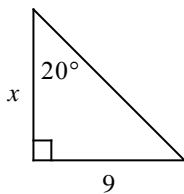
_____ 41. Write the tangent ratios for $\angle Y$ and $\angle Z$.
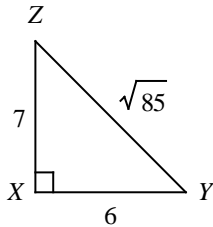
Not drawn to scale

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

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

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

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

Find the value of x. Round your answer to the nearest tenth.
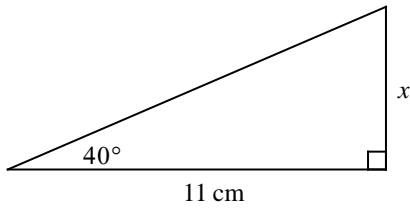
_____ 42.

Not drawn to scale

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

_____ 43. Viola drives 170 meters up a hill that makes an angle of $6°$ with the horizontal. To the nearest tenth of a meter, what horizontal distance has she covered?
a. 171.5 m   b. 169.1 m   c. 1617.4 m   d. 17.8 m

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

_____ 44.

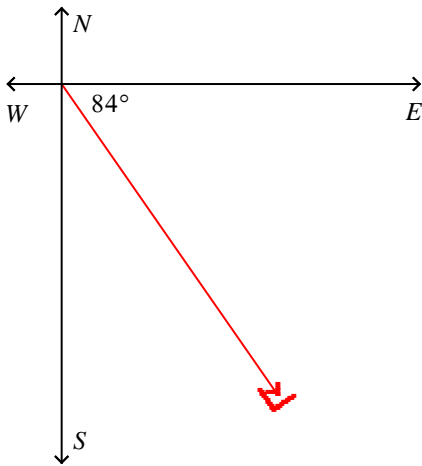
Not drawn to scale

a. 7.1 cm   b. 13.1 cm   c. 9.2 cm   d. 8.4 cm

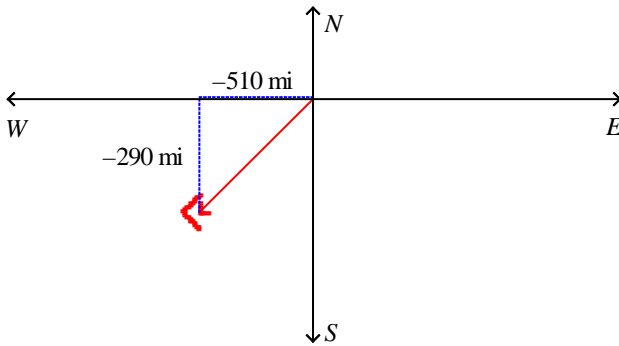**Use compass directions to describe the direction of the vector.**
(Not drawn to scale)

_____ 45.

a. 84° north of west   c. 84° south of east
b. 84° south of west   d. 84° north of east

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

_____ 46.

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

_____ 47. Miguel is driving his motorboat across a river. The speed of the boat in still water is 13 mi/h. The river flows directly south at 5 mi/h. If Miguel heads directly west, what are the boat's resultant speed and direction? (Not drawn to scale)

N

13 mi/h

W   E

5 mi/h

S
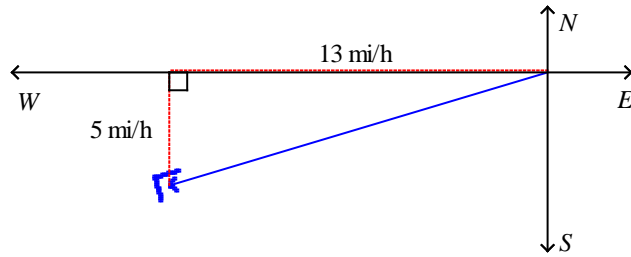
a. 21 mi/h; 13.9° north of west   c. 13.9 mi/h; 21° north of west
b. 13.9 mi/h; 21° south of west   d. 21 mi/h; 13.9° south of west

_____ 48. 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
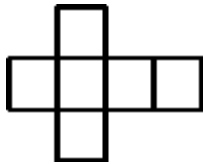
Find the area of the triangle. Give the answer to the nearest tenth. The drawing may not be to scale.
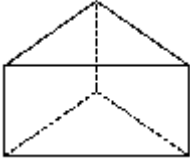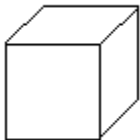
_____ 49.

4.7 m

47°

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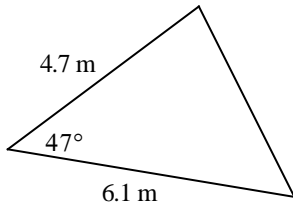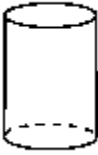
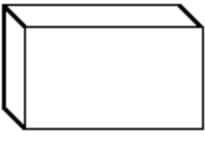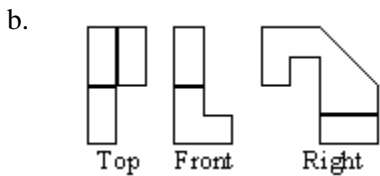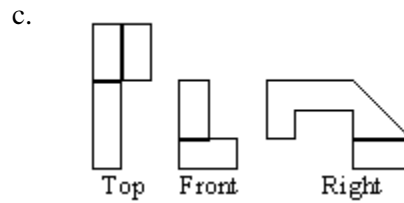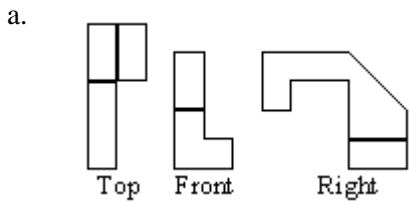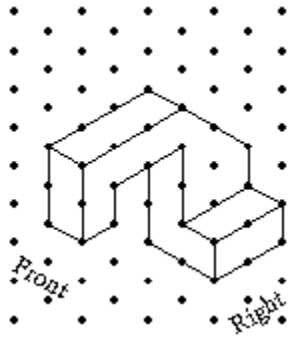a. 10.5 m^2 b. 9.8 m^2 c. 19.6 m^2 d. 21.0 m^2

_____ 50. Which three-dimensional figure matches this net?

a.

c.

b.

d.

_____ 51. Match the isometric drawing with the correct orthographic drawing.

a.

Top   Front   Right

b.

Top   Front   Right

c.

Top   Front   Right

d.

Top   Front   Right
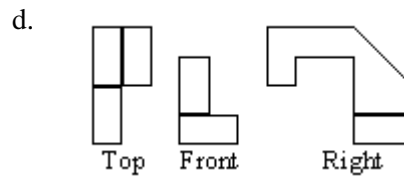
_____ 52. A jewelry store buys small boxes in which to wrap items that they sell. The diagram below shows one of the boxes. Find the lateral area and the surface area of the box to the nearest whole number.

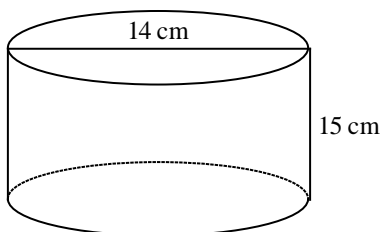2.54 cm   5 cm
12 cm
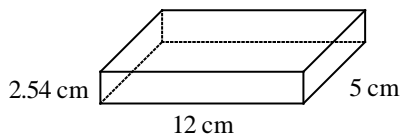
Not drawn to scale

a. 90 cm^2; 146 cm^2

b. 90 cm^2; 206 cm^2

c. 181 cm^2; 206 cm^2

d. 181 cm^2; 146 cm^2

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

_____ 53.

14 cm

15 cm

Not drawn to scale

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

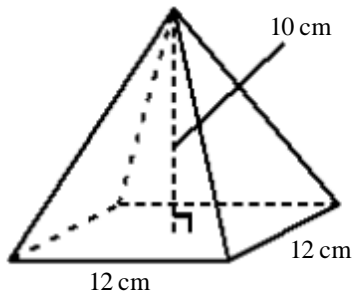**Find the surface area of the pyramid shown to the nearest whole number.**

____ 54.

6 ft

5 ft

5 ft
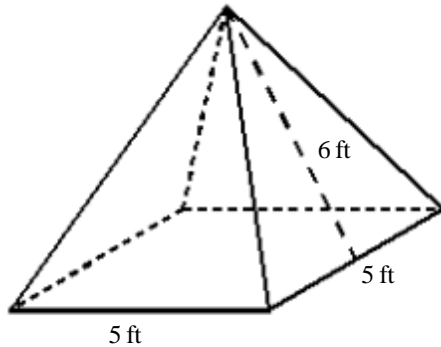
Not drawn to scale

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

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

____ 55.

10 cm

12 cm

12 cm

Not drawn to scale

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

____ 56. What is the maximum volume of a pyramid that can fit inside a cube that has side 18 cm long?

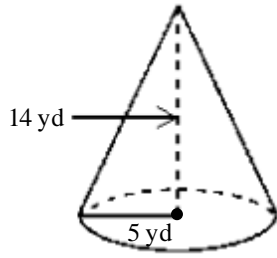a. 5832 cm^3 b. 2916 cm^3 c. 1944 cm^3 d. 972 cm^3

____ 57. 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

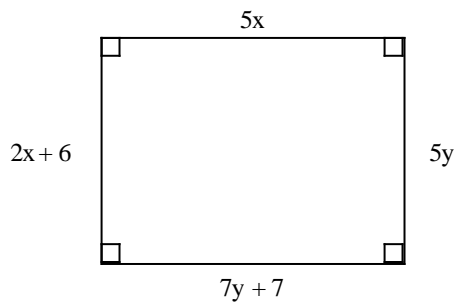**Find the volume of the cone shown as a decimal rounded to the nearest tenth.**
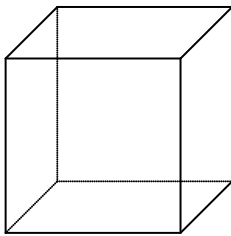
_____ 58.

14 yd

5 yd

Not drawn to scale

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

Short Answer

59. Find the values of the variables and the lengths of the sides of this rectangle. The diagram is not to scale.

5x

2x + 6

5y

7y + 7

Consider the cube shown below.

a.   **Draw a cross section formed by a plane intersecting the cube as described below.**
b.   **Describe the cross section.**

60. The plane intersects three adjacent faces.