

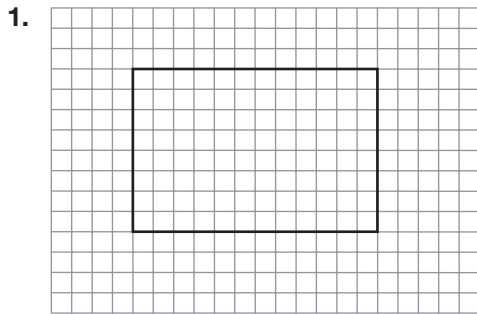
Name _____ Date _____

Weaving a Rug

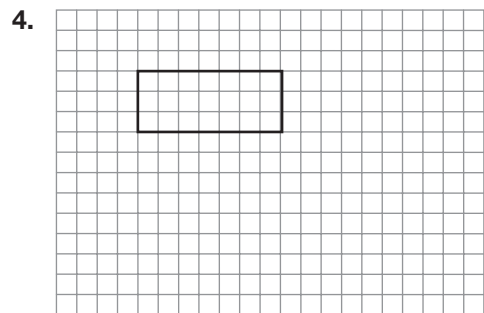
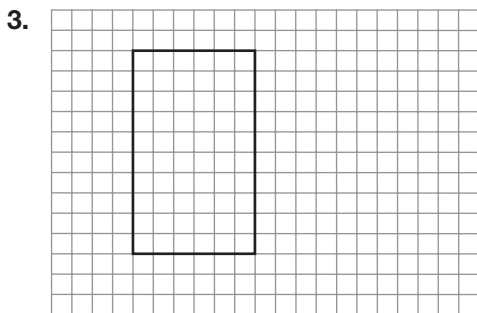
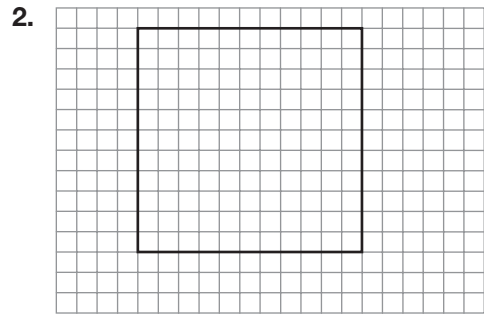
Area and Perimeter of Rectangles and Squares

Problem Set

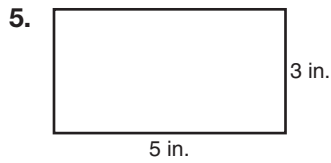
Calculate the perimeter of each rectangle. Each square on the grid represents a square that is one foot long and one foot wide.



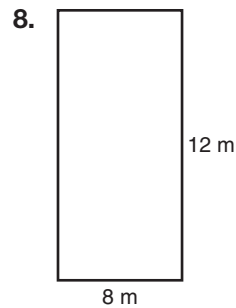
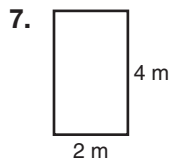
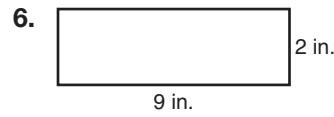
$$\begin{aligned} \text{Perimeter} &= 2(12) + 2(8) \\ &= 24 + 16 = 40 \text{ feet} \end{aligned}$$



Calculate the perimeter of each rectangle.

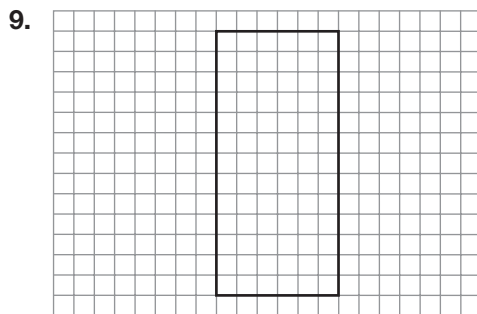


$$P = 2(5) + 2(3) = 10 + 6 = 16 \text{ in.}$$

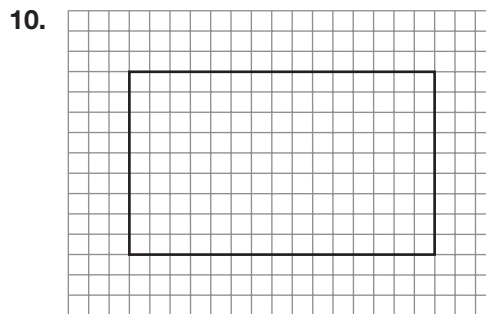


3

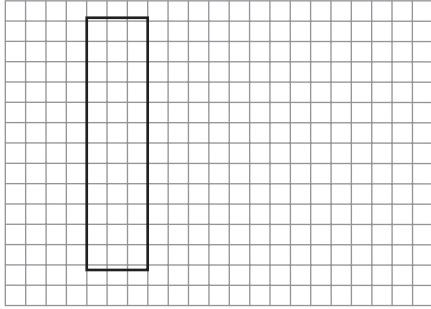
Calculate the area of each rectangle. On the grids, each grid square is one foot long and one foot wide.



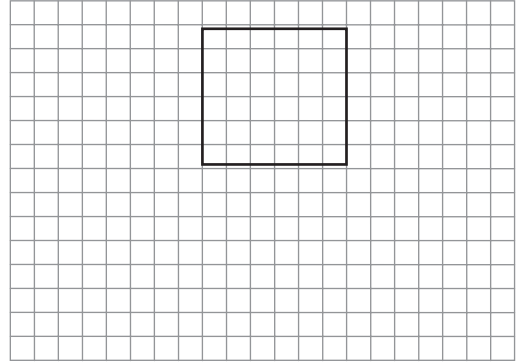
$$\text{Area} = 6(13) = 78 \text{ square feet}$$



11.

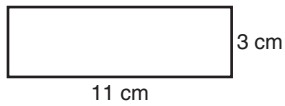


12.



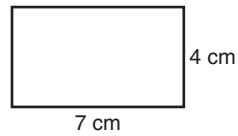
Calculate the area of each rectangle.

13.

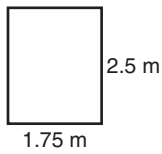


$$A = 11(3) = 33 \text{ cm}^2$$

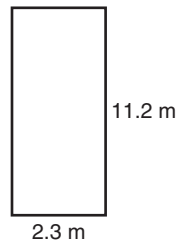
14.



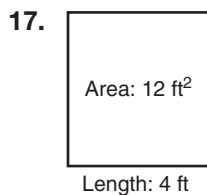
15.



16.



In each rectangle, the length, width, or area is unknown. Calculate the value of the unknown measure.

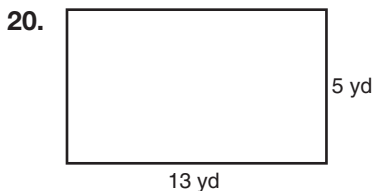
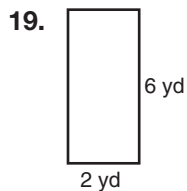
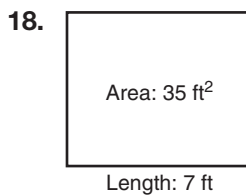


$$A = \ell w$$

$$12 = 4w$$

$$3 = w$$

The width is 3 feet.



3

Calculate the missing measures using the given measure for each square.

21. Side length: 6 feet

Area: 36 square feet

Perimeter: 24 feet

22. Side length: 18 centimeters

Area:

Perimeter:

23. Side length:

Area: 16 square inches

Perimeter:

24. Side length:

Area:

Perimeter: 36 meters

Use the given information to answer each question.

- 25.** You are making a rectangular flower bed in your front yard. You want the area of the flower bed to be 300 square feet. The length of the flower bed will run along the front porch, which is 20 feet long. What will be the width of the flower bed?

$$\text{Area} = \text{length} \times \text{width}$$

$$300 = 20w$$

$$15 = w$$

The flower bed will be 15 feet wide.

- 26.** Mrs. Tomas is knitting a rectangular blanket. She wants the blanket to cover 40 square feet and be 5 feet wide. What should be the length of the blanket?

- 27.** Mr. Green is baking a square cake. He plans to frost only the top of the cake. He has enough frosting to cover 144 square inches of cake, and he wants to use all of the icing. What should be the dimensions of the cake?

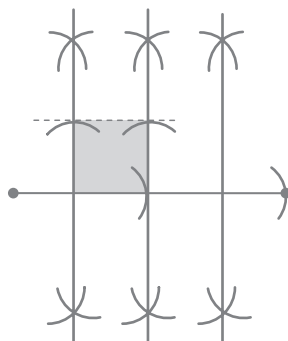
- 28.** A square invitation fits into an envelope snugly. The envelope has an area of 64 square inches. What are the dimensions of the card?

Construct each figure given the perimeter of the figure.

29. Construct a square if \overline{CD} is the perimeter of the square.



The shaded area represents the square.



3

30. Construct a square if \overline{EF} is the perimeter of the square.



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31. Construct a rectangle that is not a square if \overline{GH} is the perimeter of the rectangle.



32. Construct a rectangle that is not a square if \overline{LM} is the perimeter of the rectangle.



3

Name _____

Date _____

Boundary Lines Area of Parallelograms and Triangles

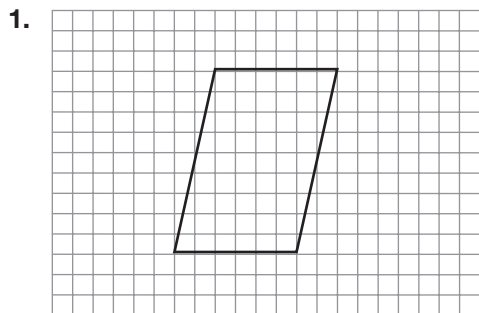
Vocabulary

Define each term in your own words.

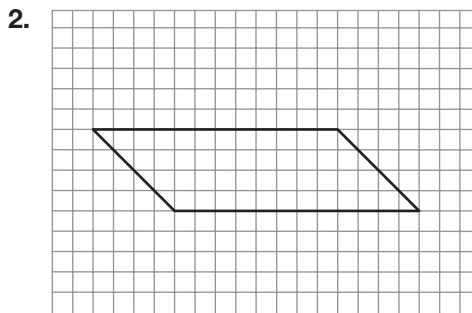
1. parallelogram
2. altitude of a parallelogram
3. height of a parallelogram
4. altitude of a triangle
5. height of a triangle

Problem Set

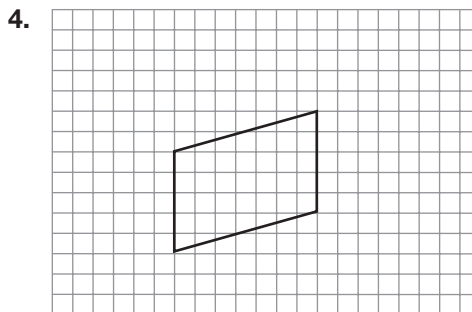
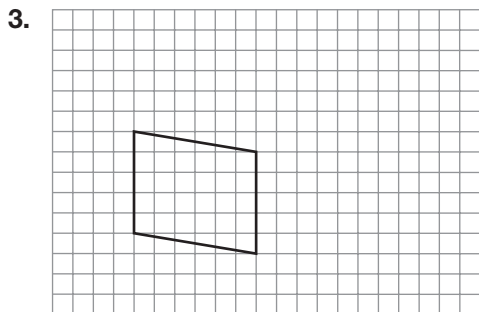
Calculate the area of each parallelogram. Each square on the grid represents a square that is one centimeter long and one centimeter wide.



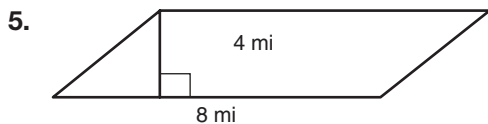
$$\text{Area} = 6(9) = 54 \text{ square centimeters}$$



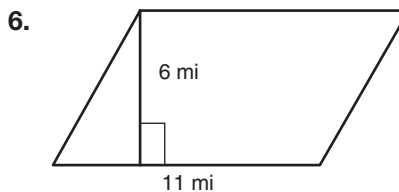
3

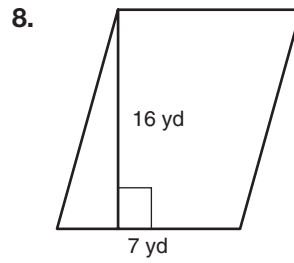
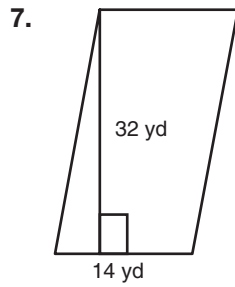


Calculate the area of each parallelogram.

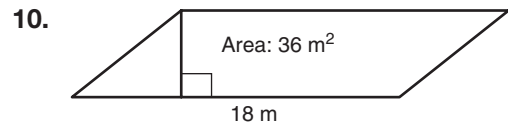
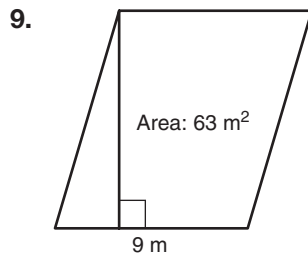


$$A = 8(4) = 32 \text{ mi}^2$$





In each parallelogram, the base, height, or area is unknown. Calculate the value of the unknown measure.

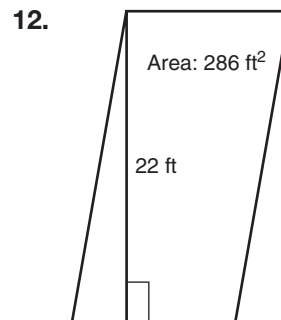
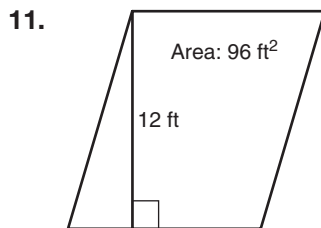


$$A = bh$$

$$63 = 9h$$

$$7 = h$$

The height is 7 meters.



Use the given information to answer each question.

13. Elsa is helping to decorate her school's stage for the class play. A part of the stage is in the shape of a parallelogram, with a base length of 16 feet and a height of 4 feet. Elsa has been asked to cover this part of the stage with fabric. The fabric costs \$0.89 per square foot. What is the total cost of fabric needed to cover this part of the stage?

$$A = bh$$

$$A = 16(4)$$

$$A = 64$$

The area of the part of the stage that needs to be covered is 64 square feet.

The total cost of fabric needed to cover this part of the stage is $64(\$0.89) = \56.96 .

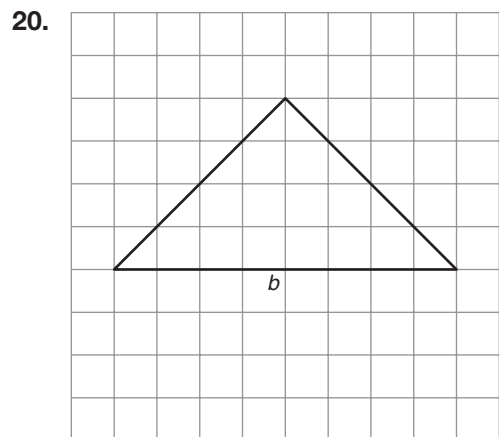
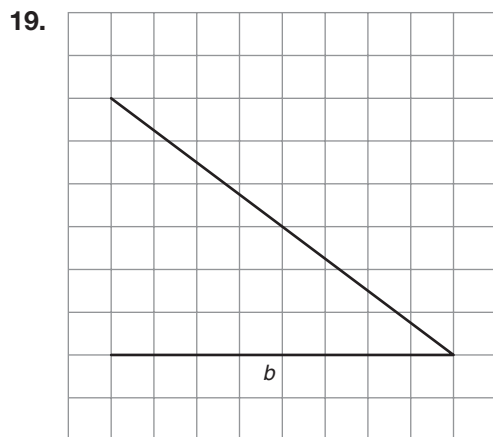
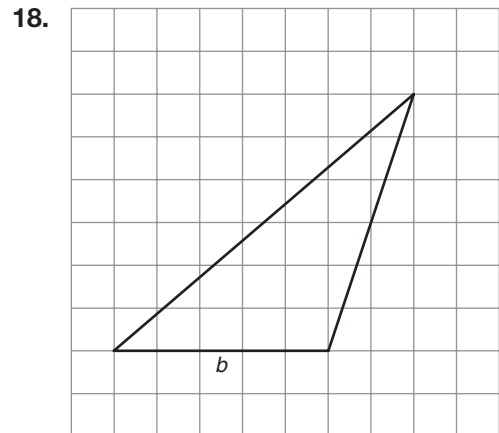
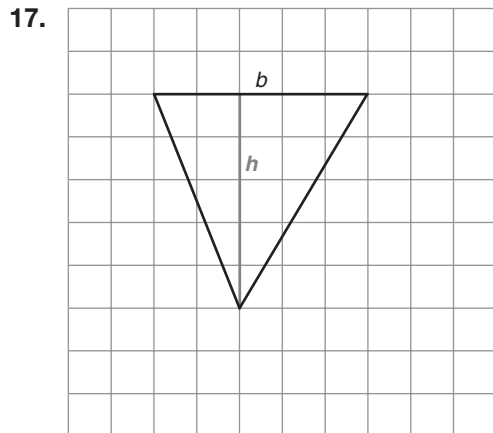
14. The beautification committee is mulching the flower beds around the school. They determine that it will cost \$1.25 to mulch each square foot of flower bed. The front flower bed is in the shape of a parallelogram with a base length of 12 feet and a height of 7 feet. How much will it cost the beautification committee to mulch this flower bed?

3

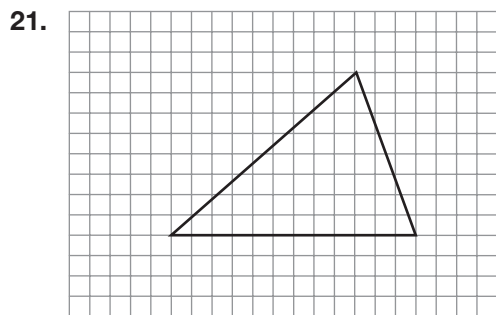
15. An art gallery would like to paint 75 different parallelogram-shaped sections of their walls for a showing. Each section will have a base length of 3 feet and a height of 2 feet. How many square feet will be painted in all?

16. A window is made out of 4 parallelogram-shaped panes of glass. Each pane of glass has a base length of 2 feet and a height of 2 feet. What is the total area of the window?

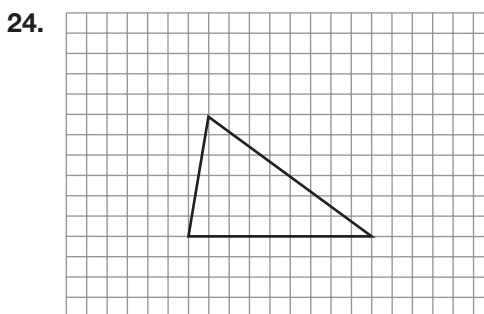
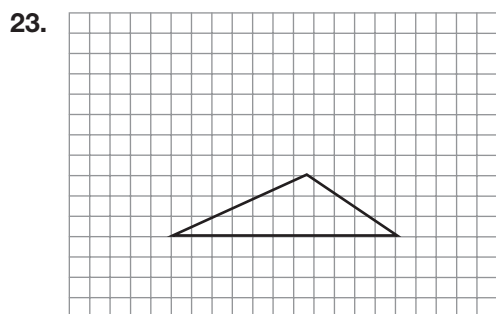
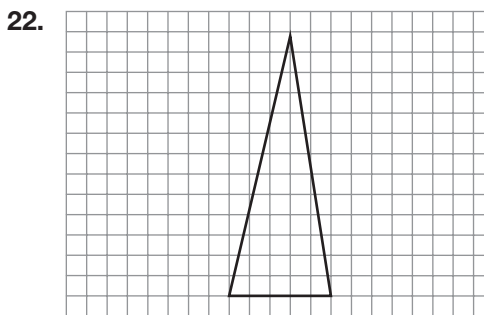
The base of each triangle is labeled. Draw a segment that represents the height of the triangle.



Calculate the area of each triangle. Each square on the grid represents a square that is one foot long and one foot wide.

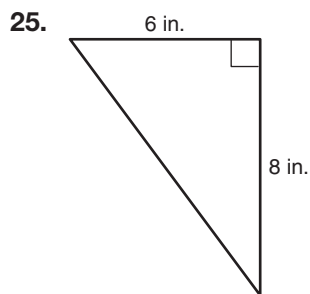


$$\text{Area} = \frac{1}{2}(12)(8) = 48 \text{ square feet}$$

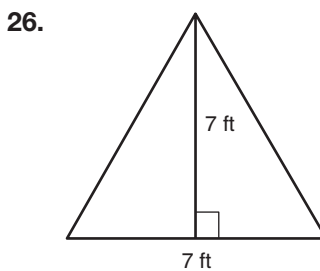


3

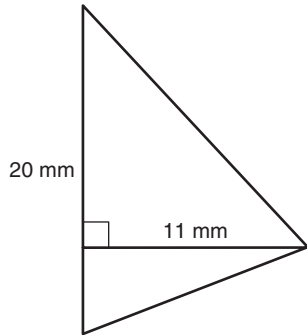
Calculate the area of each triangle.



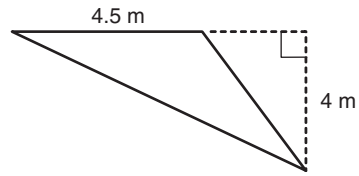
$$A = \frac{1}{2}(6)(8) = \frac{1}{2}(48) = 24 \text{ in.}^2$$



27.

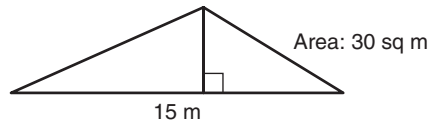


28.

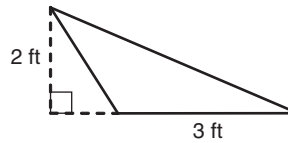


In each triangle, the base, height, or area is unknown. Calculate the value of the unknown measure.

29.



30.



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

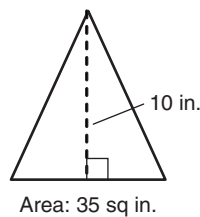
$$30 = \frac{1}{2}(15)h$$

$$60 = 15h$$

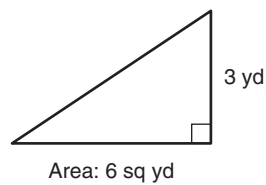
$$4 = h$$

The height of the triangle is 4 meters.

31.

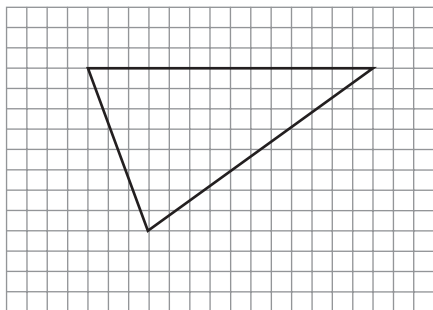


32.



Use the given information to answer each question.

33. A section of land on a farm is enclosed by a fence. The fence is represented on the grid below, where each square on the grid represents a square that is one meter long and one meter wide. What is the area of land enclosed by the fence?

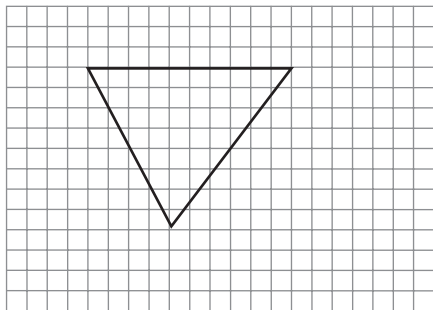


$$\text{Area} = \frac{1}{2}(14)(8) = 56$$

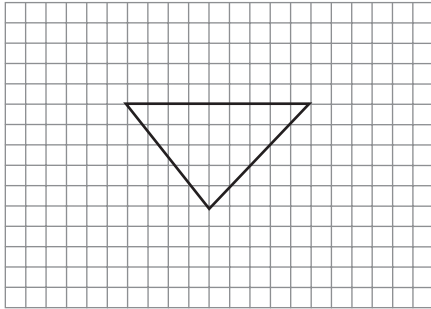
The area of land enclosed by the fence is 56 square meters.

3

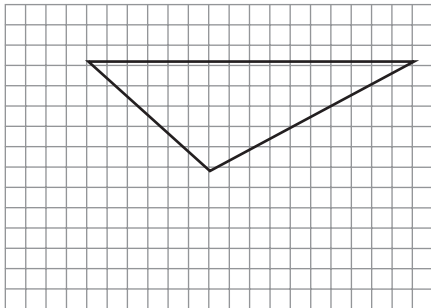
34. Janine made a grid using nails hammered into a piece of wood so that they are one inch apart. She then used three rubber bands to create a triangle on the grid. The grid and triangle are shown below. What is the area of the triangle Janine enclosed on the grid?



35. Mr. Carslile is making a triangular template to be used during class. He places the triangle on grid paper so it is easier to trace, as shown below. Each grid on the grid paper is one centimeter long and one centimeter wide. What is the area of the triangle of Mr. Carslile's triangular template?

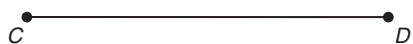


36. The Ellenberg family is building a triangular swimming pool in their backyard. The aerial view of the pool is shown on the grid below. If each square on the grid is equal to one square foot, what is the area of the pool?

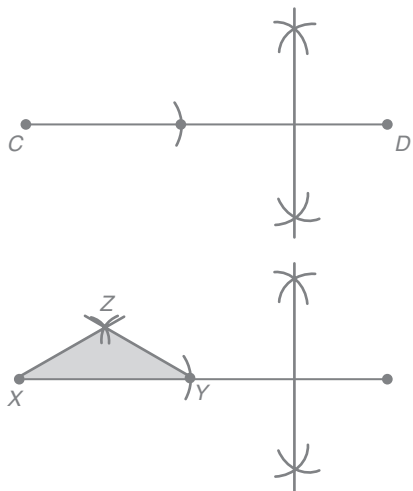


Construct each isosceles triangle given the perimeter.

37. Construct an isosceles triangle XYZ if \overline{CD} is the perimeter of the triangle.



Sample answer:



3

38. Construct an isosceles triangle LMN if \overline{TR} is the perimeter of the triangle.



39. Construct an isosceles triangle PQR if \overline{YZ} is the perimeter of the triangle.



40. Construct an isosceles triangle ABC if \overline{KL} is the perimeter of the triangle.



Name _____

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The Keystone Effect Area of a Trapezoid

Vocabulary

Explain how each set of terms are related.

1. legs of a trapezoid and bases of a trapezoid

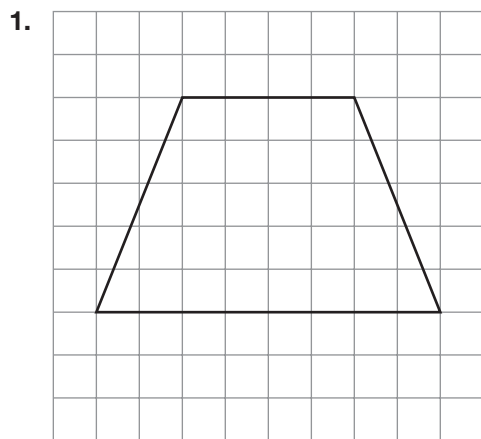
2. altitude of a trapezoid and height of a trapezoid

3

Problem Set

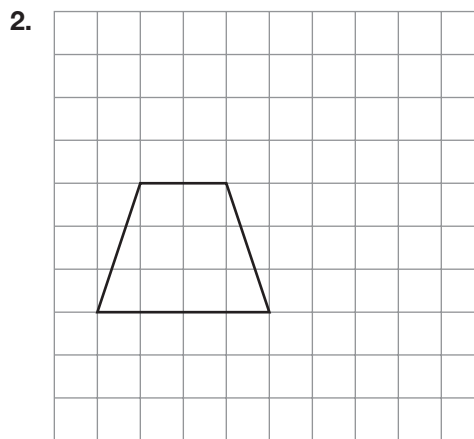
Calculate the area of each trapezoid. Each square on the grid represents a square that is two inches long and two inches wide.

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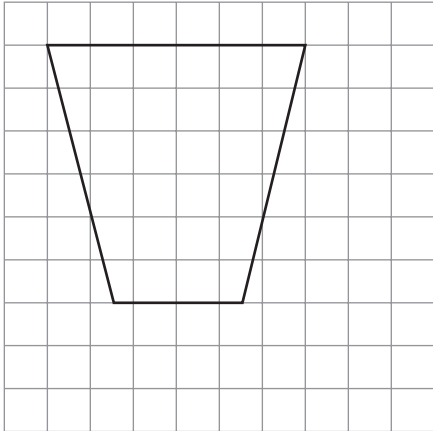


$$A = \frac{1}{2}(8 + 16)10 = \frac{1}{2}(24)(10) = 120$$

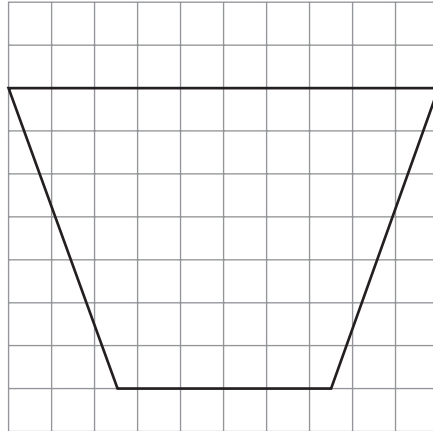
120 square inches



3.



4.



3

Calculate the area of each trapezoid with the given dimensions, where h represents the height, b_1 represents the length of a base, and b_2 represents the length of the other base.

5. $h = 2, b_1 = 4, b_2 = 3$

$$A = \frac{1}{2}(4 + 3)2 = \frac{1}{2}(7)(2) = 7$$

The area is 7 square units.

6. $h = 6, b_1 = 5, b_2 = 3$

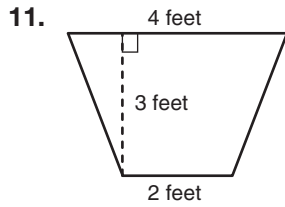
7. $h = 3, b_1 = 11, b_2 = 7$

8. $h = 5, b_1 = 9, b_2 = 1$

9. $h = \frac{1}{2}, b_1 = 10, b_2 = 14$

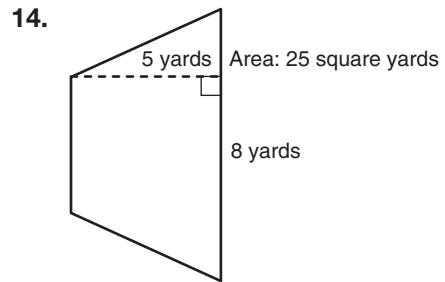
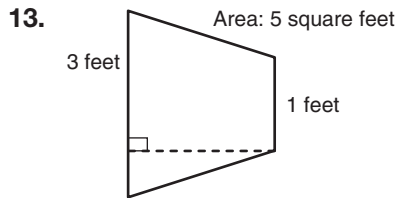
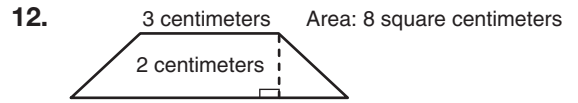
10. $h = 4, b_1 = \frac{2}{3}, b_2 = \frac{4}{3}$

In each trapezoid, one base, height, or area is unknown. Calculate the value of the unknown measure.



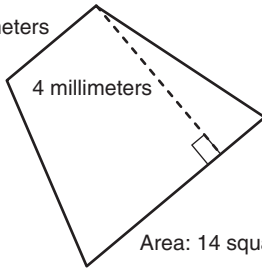
$$A = \frac{1}{2}(2 + 4)3 = \frac{1}{2}(6)(3) = 9$$

The trapezoid has an area of 9 square feet.



15.

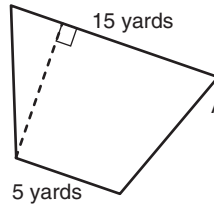
2 millimeters



Area: 14 square millimeters

16.

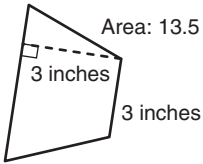
15 yards



Area: 70 square yards

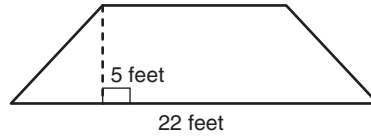
17.

Area: 13.5 square inches



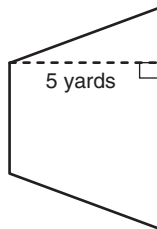
18.

13 feet



19.

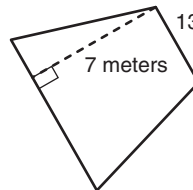
2 yards



8 yards

20.

13 meters

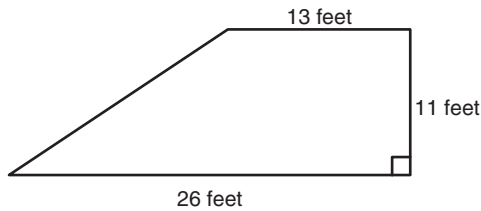


Area: 98 square meters

3

Use the given information to answer each question.

21. The side of a staircase has the shape of a trapezoid with the dimensions shown in the diagram. You want to paint this side of the staircase. How many square feet will you need to cover with paint?



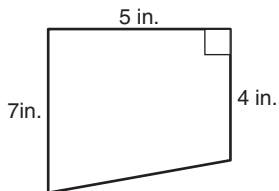
$$A = \frac{1}{2}(b_1 + b_2)h$$

$$A = \frac{1}{2}(26 + 13)11$$

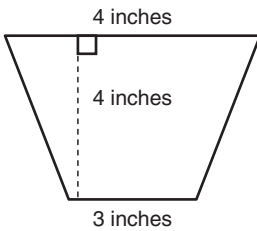
$$A = 214.5$$

You will need to cover 214.5 square feet with paint.

22. Yvonne cut a picture into the shape of a trapezoid to place into her scrap book. The picture is shown below. What is the area of the picture?

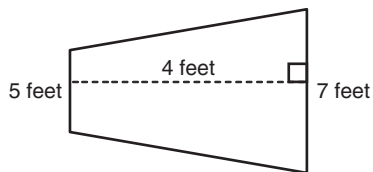


23. A mosaic on a CD cover is in the shape of an isosceles trapezoid with the dimensions shown in the diagram. The artist needs to tell the production company the area of the mosaic. How many square inches is the mosaic?



3

24. The planning committee submitted a plan to the town architect to revitalize the town square. Their plan includes a new flagpole with a concrete base in the shape of a trapezoid. The base of the trapezoid and its dimensions are shown in the figure below. What is the area of the base proposed by the planning committee?

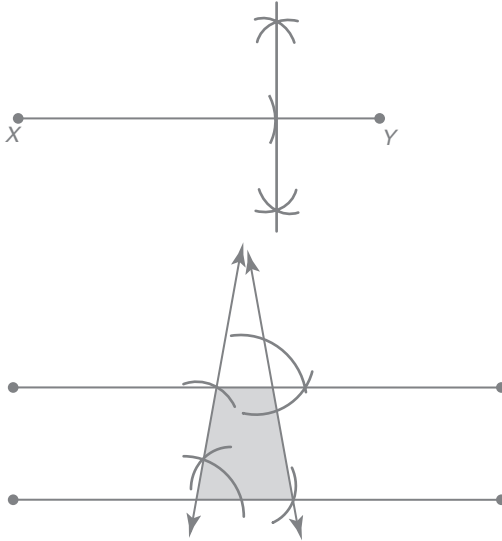


Construct each isosceles trapezoid given the perimeter.

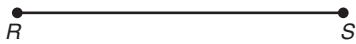
25. Construct an isosceles trapezoid if \overline{XY} is the perimeter of the trapezoid.



Sample answer:



26. Construct an isosceles trapezoid if \overline{RS} is the perimeter of the trapezoid.



27. Construct an isosceles trapezoid if \overline{LM} is the perimeter of the trapezoid.



3

28. Construct an isosceles trapezoid if \overline{UV} is the perimeter of the trapezoid.



Name _____ Date _____

Signs, Signs, Every Place There Are Signs! Area of Regular Polygons

Vocabulary

Draw an example of each term.

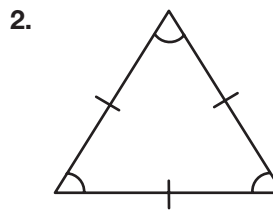
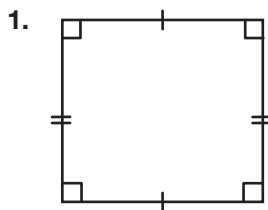
1. congruent polygons

2. apothem

3

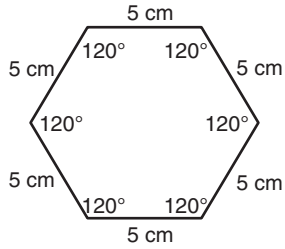
Problem Set

Determine whether each polygon is a regular polygon.

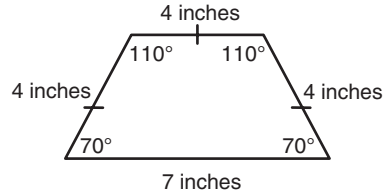


The polygon is not a regular polygon.

3.

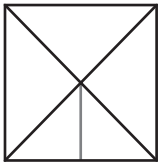


4.



Draw an apothem of each figure.

5.

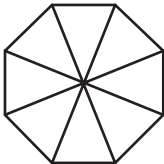


6.

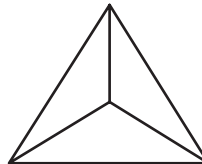


3

7.



8.



Write a formula for the area of each regular polygon. State the area in terms of an apothem a of the polygon.

9. regular octagon with side h

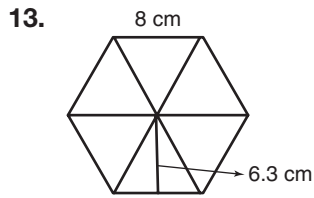
$$A = \left(\frac{1}{2}ha\right)8 = 4ha$$

10. regular hexagon with side c

11. regular nonagon with side b

12. regular decagon with side d

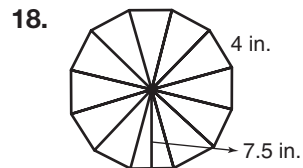
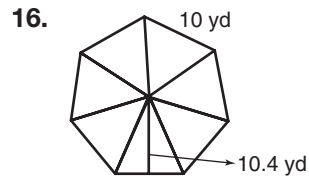
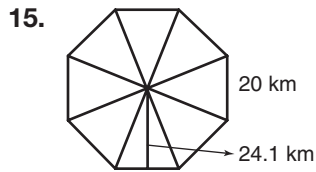
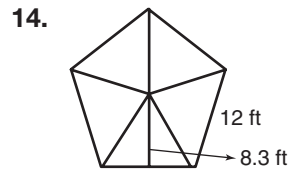
Calculate the area of each regular polygon.



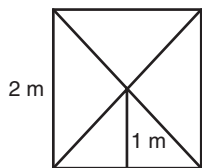
$$A = \frac{1}{2}(8)(6.3)(6)$$

$$A = 151.2$$

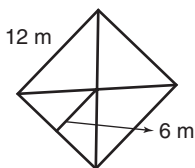
The area is 151.2 square centimeters.



19.



20.



Use the given information to calculate the area of each regular polygon.

21. A regular decagon has a side length of 26 yards and an apothem length of 40 yards. What is the area of the regular decagon?

$$A = \frac{1}{2}(26)(40)(10)$$

$$= 5200$$

3

The area of the regular decagon is 5200 square yards.

22. A regular 15-gon has a side length of 10 feet and an apothem length of 23.5 feet. What is the area of the regular 15-gon?

23. A regular 12-gon has a side length of 11 meters and an apothem length of 20.5 meters. What is the area of the regular 12-gon?

24. A regular octagon has a perimeter of 36 millimeters and an apothem length of 5.4 millimeters. What is the area of the regular octagon?

Name _____ Date _____

- 25.** A regular pentagon has a perimeter of 625 centimeters and an apothem length of 86 centimeters. What is the area of the regular pentagon?
- 26.** A regular 20-gon has a perimeter of 1000 inches and an apothem length of 157.8 inches. What is the area of the regular 20-gon?

Name _____ Date _____

Say Cheese! Area and Circumference of a Circle

Vocabulary

Write the term that best completes each statement.

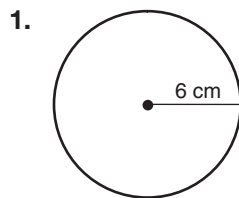
concentric circles	diameter	radius	circle
irrational number	circumference	annulus	

1. The _____ is the region bounded by two concentric circles.
2. A decimal that never repeats or terminates is a(n) _____.
3. _____ are circles that share the same center.
4. The distance across a circle through the center is the _____.
5. The _____ is the distance around a circle.
6. The set of all points in a plane equidistant from a given point is a(n) _____.
7. The distance that is equal to one half the diameter of a circle is the _____.

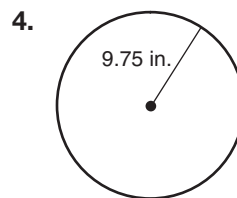
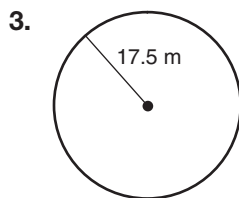
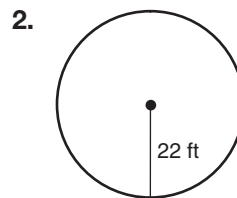
3

Problem Set

Calculate the diameter of each circle.

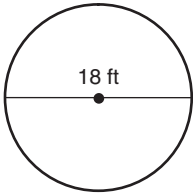


$$d = 2r = 2(6) = 12 \text{ cm}$$



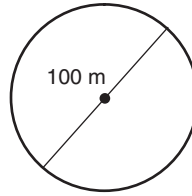
Calculate the radius of each circle.

5.

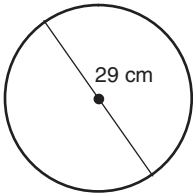


$$r = \frac{d}{2} = \frac{18}{2} = 9 \text{ ft}$$

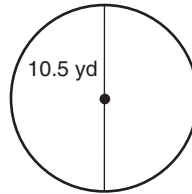
6.



7.



8.



3

Calculate the circumference of each circle given the radius r of the circle. Write your answers in terms of π .

9. $r = 8 \text{ cm}$

$$C = 2\pi r = 2(\pi)(8) = 16\pi \text{ cm}$$

10. $r = 2 \text{ cm}$

11. $r = 3 \text{ in.}$

12. $r = 10 \text{ ft}$

13. $r = 7.8 \text{ m}$

14. $r = 4.2 \text{ cm}$

Calculate the area of each circle given the radius r of the circle. Write your answers in terms of π .

15. $r = 6 \text{ m}$

$$A = \pi r^2 = \pi(6^2) = 36\pi \text{ m}^2$$

16. $r = 4 \text{ in.}$

17. $r = 1 \text{ ft}$

18. $r = 12 \text{ cm}$

19. $r = 0.5 \text{ mm}$

20. $r = 9.8 \text{ yd}$

Calculate the radius of each circle given the circumference C of the circle. Write your answers in terms of π .

21. $C = 90\pi \text{ mm}$

$$C = 2\pi r$$

$$90\pi = 2\pi r$$

$$45 = r$$

$$r = 45 \text{ mm}$$

22. $C = 220\pi \text{ ft}$

23. $C = \pi \text{ yd}$

24. $C = 13\pi \text{ cm}$

25. $C = 6.5\pi \text{ in.}$

26. $C = 10.8\pi \text{ mi}$

Calculate the radius of each circle given the area A of the circle. Write your answers in terms of π .

27. $A = 9\pi \text{ cm}^2$

$$A = \pi r^2$$

$$9\pi = \pi r^2$$

$$9 = r^2$$

$$3 = r$$

$$r = 3 \text{ cm}$$

28. $A = 16\pi \text{ m}^2$

29. $A = 25\pi \text{ in.}^2$

30. $A = 49\pi \text{ yd}^2$

31. $A = \frac{4}{9}\pi \text{ mm}^2$

32. $A = \frac{1}{4}\pi \text{ m}^2$

3

Use the given information to answer each question.

33. If a circle has a circumference of 6π inches, what is its area?

$$C = 2\pi r$$

$$6\pi = 2\pi r$$

$$3 = r$$

$$A = \pi r^2$$

$$A = \pi(3^2)$$

$$A = 9\pi$$

The area of the circle is 9π square inches.

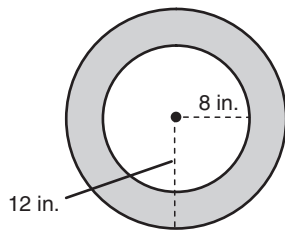
34. If a circle has a circumference of 3π feet, what is its area?

35. If a circle has an area of 4π square meters, what is its circumference?

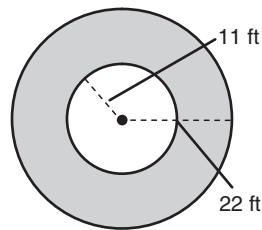
36. If a circle has an area of 25π square feet, what is its circumference?

Calculate the area of each annulus shown. Use 3.14 to approximate π .

37.



38.



Area of larger circle:

$$A = \pi r^2 = \pi(12^2) = 144\pi \approx 452.16 \text{ in.}^2$$

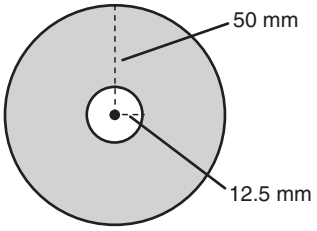
Area of smaller circle:

$$A = \pi r^2 = \pi(8^2) = 64\pi \approx 200.96 \text{ in.}^2$$

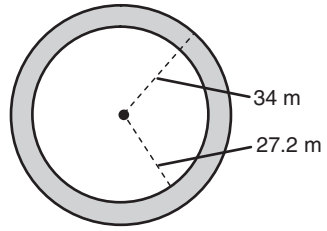
Area of annulus:

$$A \approx 452.16 - 200.96 = 251.2 \text{ in.}^2$$

39.



40.



3

Name _____

Date _____

Installing Carpeting and Tile Area and Perimeter of Composite Figures

Vocabulary

Answer the question.

1. Why are composite figures needed when calculating the area of some shapes?

Problem Set

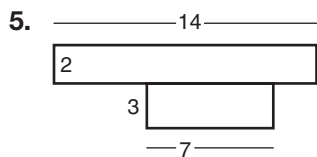
Convert the given units.

1. Convert 54 square feet into square yards.

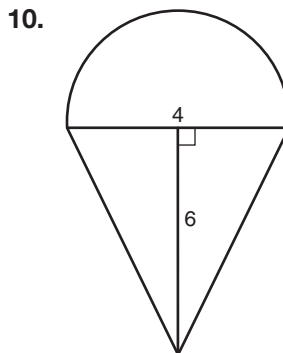
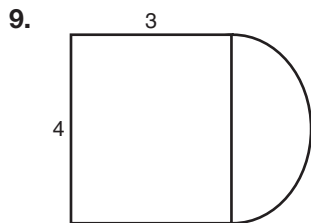
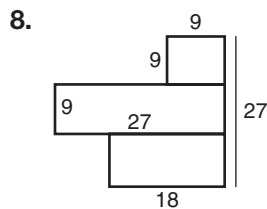
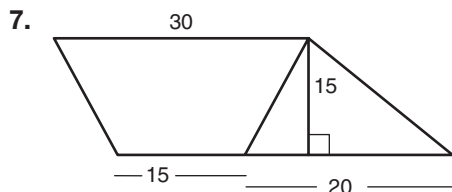
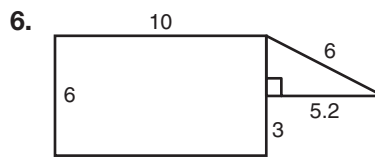
$$54 \text{ square feet} \times \frac{1 \text{ square yard}}{9 \text{ square feet}} = 6 \text{ square yards}$$

2. Convert 288 square inches into square feet.
3. Convert 9 square yards to square feet.
4. Convert 6 square feet into square inches.

Calculate the area of each figure. All measurements are in centimeters. Use 3.14 for π and round decimal answers to the nearest hundredth.

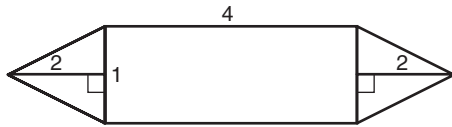


$$\begin{aligned} A &= 14(2) + 7(3) \\ &= 28 + 21 \\ &= 49 \text{ cm}^2 \end{aligned}$$

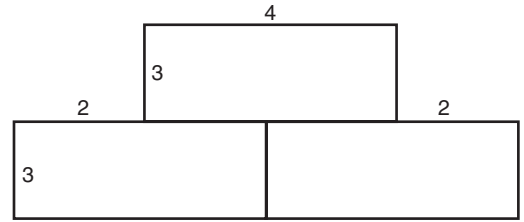


3

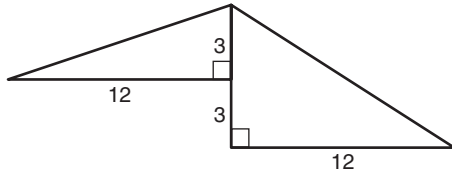
11.



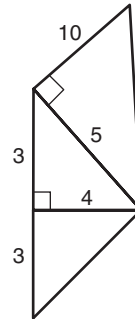
12.



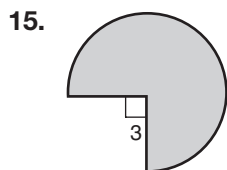
13.



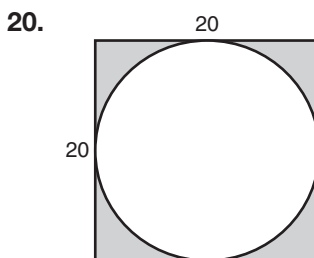
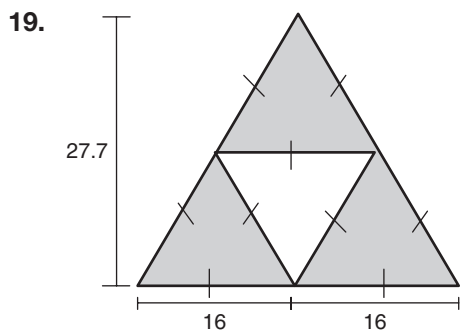
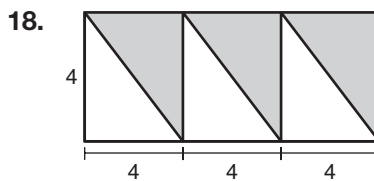
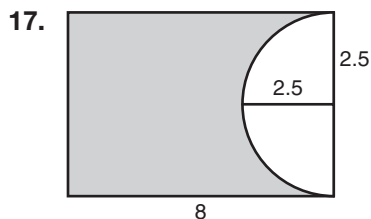
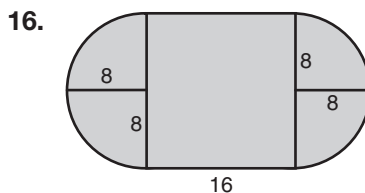
14.



Calculate the area of the shaded portion of each figure. All measurements are in inches. Use 3.14 for π and round decimal answers to the nearest hundredth.

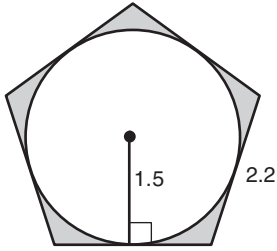


$$\begin{aligned} A &\approx \frac{3}{4}(3.14)(3^2) \\ &= \frac{3}{4}(3.14)(9) \\ &= 21.20 \text{ in.}^2 \end{aligned}$$

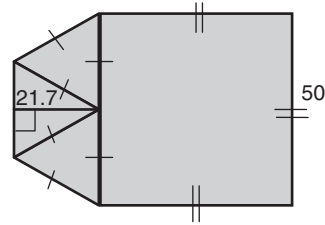


3

21.

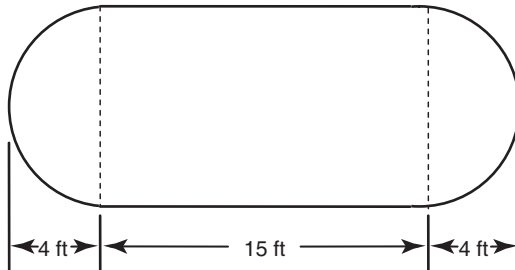


22.



Use the given information to answer each question. Where necessary, use 3.14 to approximate π .

23. Marcia is mulching a garden in her back yard. The figure below shows the shape and dimensions of the garden. It costs \$4.50 per square yard for Marcia to mulch the garden. How much does Marcia need to spend on mulch?



$$A = \frac{1}{2}\pi r^2 + \ell w + \frac{1}{2}\pi r^2 = \pi r^2 + \ell w = 16\pi + 15(8) \approx 170.24 \text{ square feet}$$

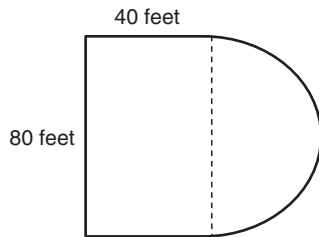
$$170.24 \text{ square feet} \times \frac{1 \text{ square yard}}{9 \text{ square feet}} \approx 18.92 \text{ square yards}$$

Total cost:

$$18.92 \text{ square yards} \times \frac{\$4.50}{\text{square yard}} = \$85.14$$

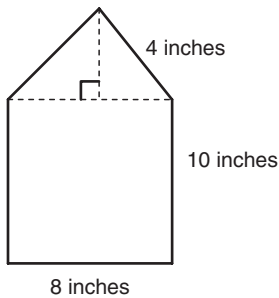
Marcia needs to spend approximately \$85.14 on mulch.

24. A fencing company received the aerial view of the plot of land shown below. The job requires fencing around the entire property shown. The value of the enclosed land is \$5.50 per square foot. How much is the plot of land worth?



3

25. Jillian is building a birdhouse. The back side of the birdhouse is shown below. The paint Jillian bought lists its coverage in square feet. How many square feet of paint will Jillian need to paint the back side of the birdhouse?



- 26.** The art club is planning to paint a mural in the front hallway of the school. The shape and dimensions of the mural are shown below, and the club plans to paint the mascot in the center of the mural. How many square feet does the mural cover?

