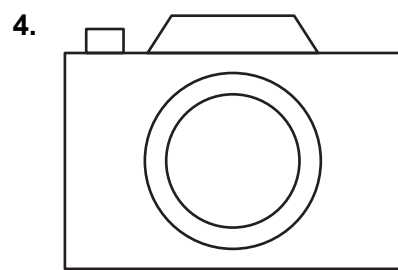
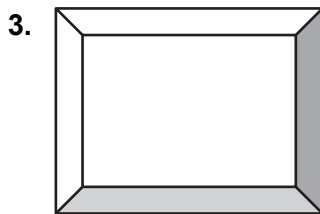
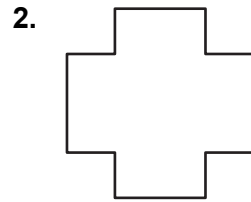
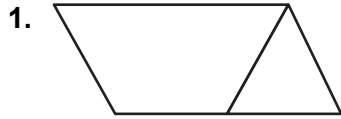
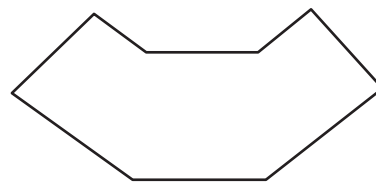


Chapter 8 Fair Game Review

Identify the basic shapes in the figure.



5. Identify the basic shapes that make up the top of your teacher's desk.



**Chapter
8****Fair Game Review** (continued)

Evaluate the expression.

6. 7^2

7. 11^2

8. $4(5)^2$

9. $7 \cdot 10^2$

10. $4(4 + 2)^2$

11. $5(6 + 3)^2$

12. $6(8 + 3)^2 + 2 \cdot 9$

13. $4(12)^2 - (6 + 4)$

14. A kilometer is 10^3 meters. You run a 5-kilometer race. How many meters do you run?

8.1**Circles and Circumference**

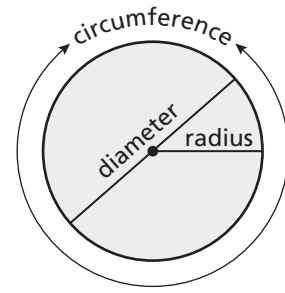
For use with Activity 8.1

Essential Question How can you find the circumference of a circle?

Archimedes was a Greek mathematician, physicist, engineer, and astronomer.

Archimedes discovered that in any circle the ratio of circumference to diameter is always the same. Archimedes called this ratio pi, or π (a letter from the Greek alphabet).

$$\pi = \frac{\text{circumference}}{\text{diameter}}$$

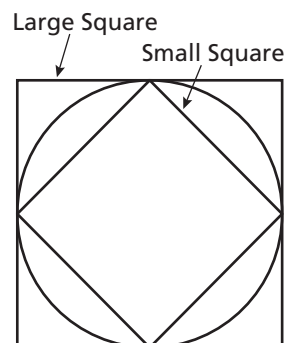


In Activities 1 and 2, you will use the same strategy Archimedes used to approximate π .

1 ACTIVITY: Approximating Pi

Work with a partner. Record your results in the first row of the table on the next page.

- Measure the perimeter of the large square in millimeters.
- Measure the diameter of the circle in millimeters.
- Measure the perimeter of the small square in millimeters.
- Calculate the ratios of the two perimeters to the diameter.
- The average of these two ratios is an approximation of π .



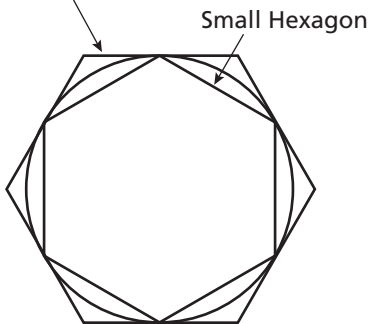
8.1 Circles and Circumference (continued)

| Sides | Large Perimeter | Diameter of Circle | Small Perimeter | $\frac{\text{Large Perimeter}}{\text{Diameter}}$ | $\frac{\text{Small Perimeter}}{\text{Diameter}}$ | Average of Ratios |
|-------|-----------------|--------------------|-----------------|--|--|-------------------|
| 4 | | | | | | |
| 6 | | | | | | |
| 8 | | | | | | |
| 10 | | | | | | |

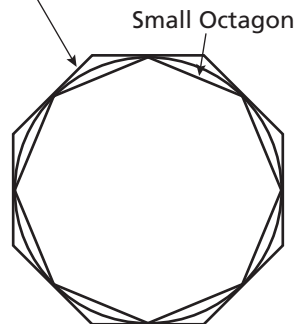
2 **ACTIVITY:** Approximating Pi

Continue your approximation of pi. Complete the table above using a hexagon (6 sides), an octagon (8 sides), and a decagon (10 sides).

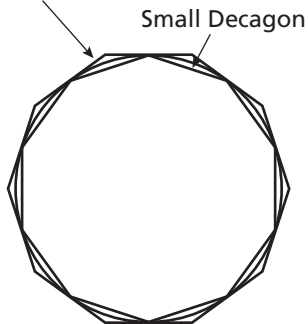
a. Large Hexagon



b. Large Octagon



c. Large Decagon



8.1 Circles and Circumference (continued)

- d. From the table, what can you conclude about the value of π ? Explain your reasoning.
- e. Archimedes calculated the value of π using polygons with 96 sides. Do you think his calculations were more or less accurate than yours?

What Is Your Answer?

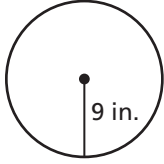
3. **IN YOUR OWN WORDS** Now that you know an approximation for π , explain how you can use it to find the circumference of a circle. Write a formula for the circumference C of a circle whose diameter is d .
4. **CONSTRUCTION** Use a compass to draw three circles. Use your formula from Question 3 to find the circumference of each circle.

8.1

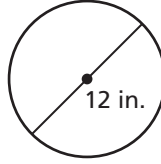
Practice

For use after Lesson 8.1

1. Find the diameter of the circle.

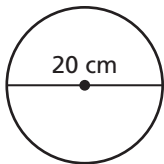


2. Find the radius of the circle.

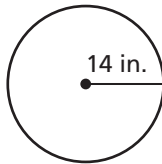


Find the circumference of the circle. Use 3.14 or $\frac{22}{7}$ for π .

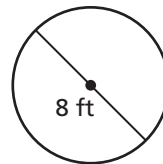
3.



4.

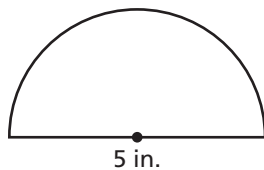


5.

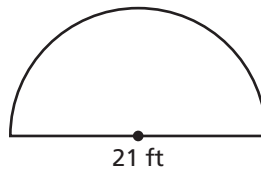


Find the perimeter of the semicircular region.

6.



7.



8. A simple impact crater on the moon has a diameter of 15 kilometers. A complex impact crater has a radius of 30 kilometers. How much greater is the circumference of the complex impact crater than the simple impact crater?

8.2

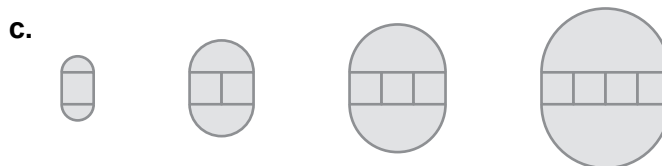
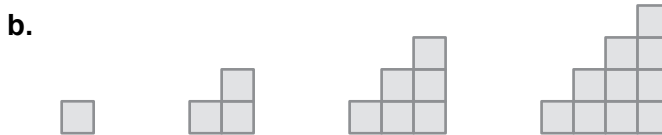
Perimeters of Composite Figures

For use with Activity 8.2

Essential Question How can you find the perimeter of a composite figure?
figure?

1 ACTIVITY: Finding a Pattern

Work with a partner. Describe the pattern of the perimeters. Use your pattern to find the perimeter of the tenth figure in the sequence. (Each small square has a perimeter of 4).

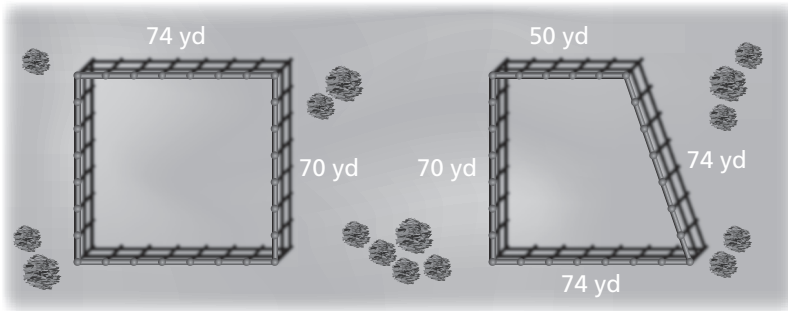


8.2 Perimeters of Composite Figures (continued)

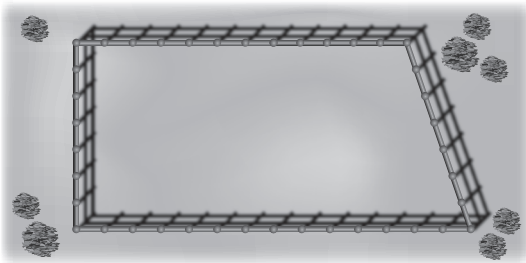
2 ACTIVITY: Combining Figures

Work with a partner.

- a. A rancher is constructing a rectangular corral and a trapezoidal corral, as shown. How much fencing does the rancher need to construct both corrals?



- b. Another rancher is constructing one corral by combining the two corrals above, as shown. Does this rancher need more or less fencing? Explain your reasoning.



- c. How can the rancher in part (b) combine the two corrals to use even less fencing?

3 ACTIVITY: Submitting a Bid

Work with a partner. You want to bid on a tiling contract. You will be supplying and installing the tile that borders the swimming pool shown on the next page.

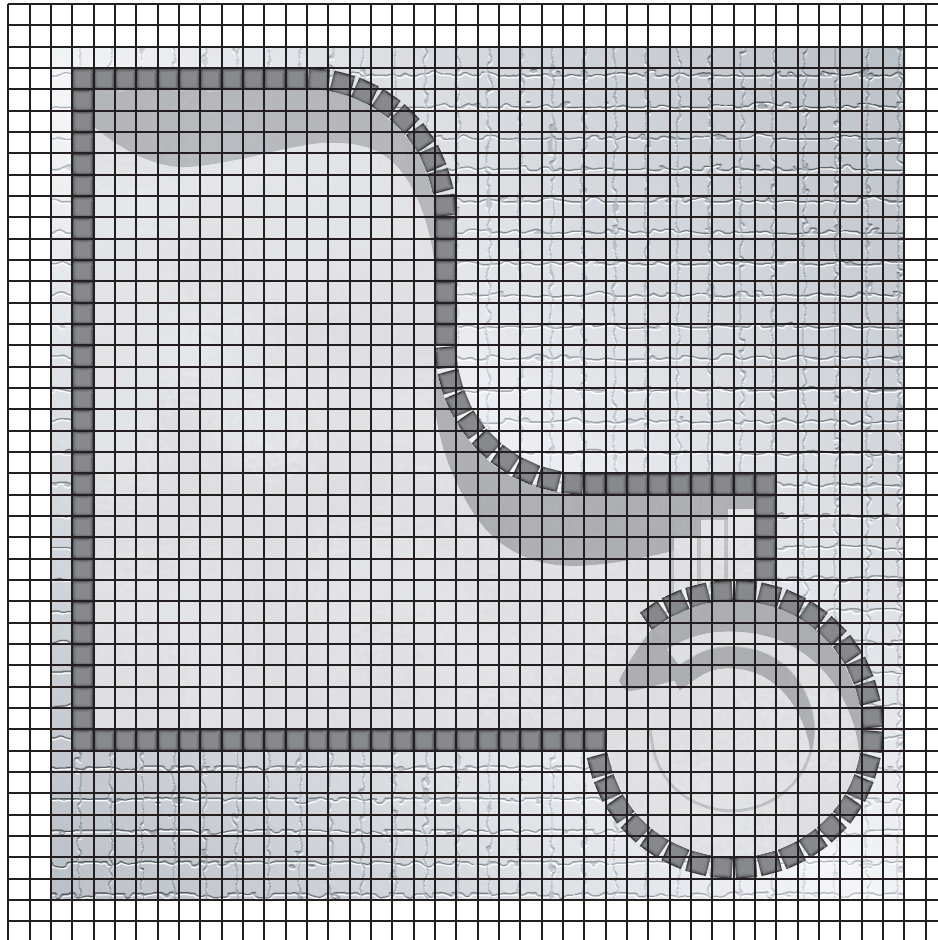
In the figure, each grid square represents 1 square foot.

- Your cost for the tile is \$4 per linear foot.
- It takes about 15 minutes to prepare, install, and clean each foot of tile.

- a. How many tiles do you need for the border?

8.2 Perimeters of Composite Figures (continued)

- b. Write a bid for how much you will charge to supply and install the tile. Include what you want to charge as an hourly wage. Estimate what you think your profit will be.



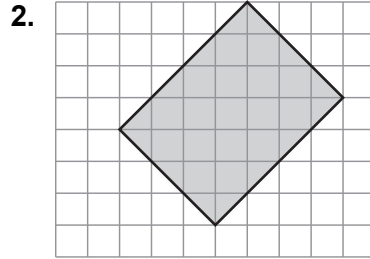
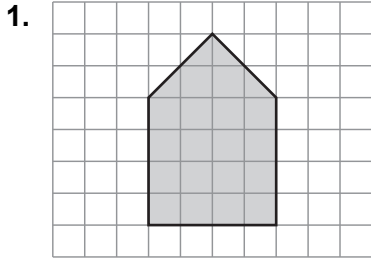
What Is Your Answer?

4. **IN YOUR OWN WORDS** How can you find the perimeter of a composite figure? Use a semicircle, a triangle, and a parallelogram to draw a composite figure. Label the dimensions. Find the perimeter of the figure.

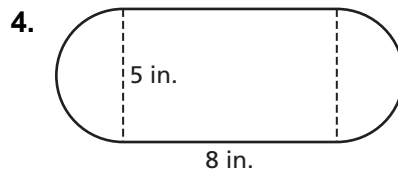
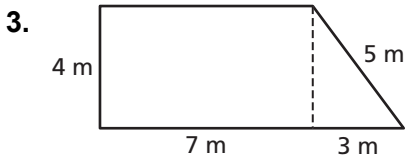
8.2

Practice
For use after Lesson 8.2

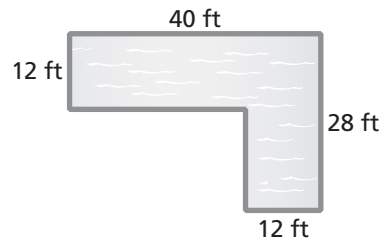
Estimate the perimeter of the figure.



Find the perimeter of the figure.



5. You are having a swimming pool installed.
a. Find the perimeter of the swimming pool.



- b. Tiling costs \$15 per yard. How much will it cost to put tiles along the edge of the pool?

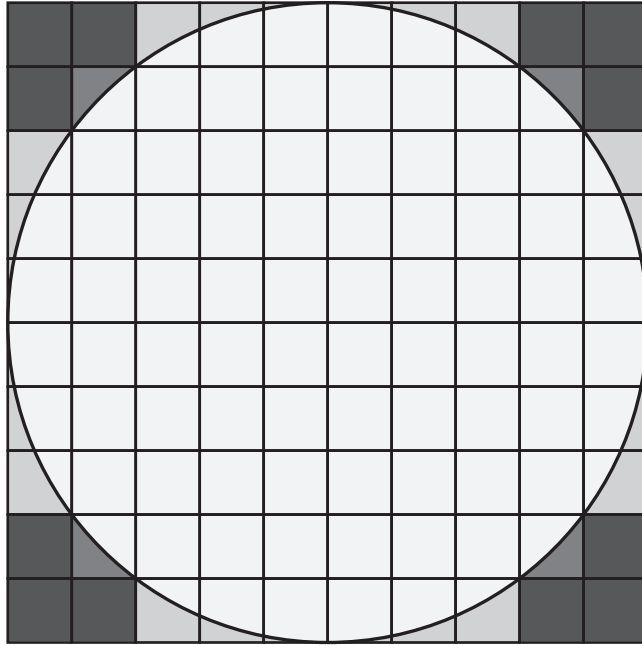
8.3

Areas of Circles
For use with Activity 8.3

Essential Question How can you find the area of a circle?



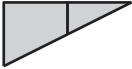
1 ACTIVITY: Estimating the Area of a Circle

Work with a partner. Each square in the grid is 1 unit by 1 unit.



a. Find the area of the large 10-by-10 square.

b. Complete the table.

| | | | |
|----------------------------|---|--|---|
| Region |  |  |  |
| Area (square units) | | | |

c. Use your results to estimate the area of the circle. Explain your reasoning.

8.3 Areas of Circles (continued)

- d. Fill in the blanks. Explain your reasoning.

Area of large square = _____ • 5^2 square units

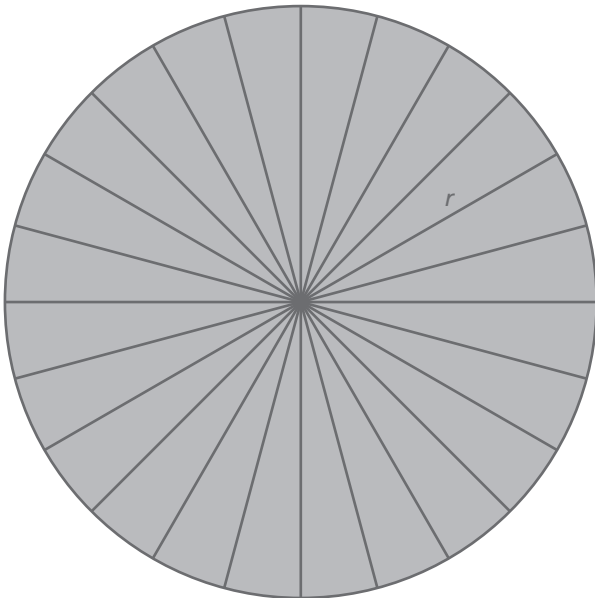
Area of circle \approx _____ • 5^2 square units

- e. What dimension of the circle does 5 represent? What can you conclude?

2 **ACTIVITY:** Approximating the Area of a Circle

Work with a partner.

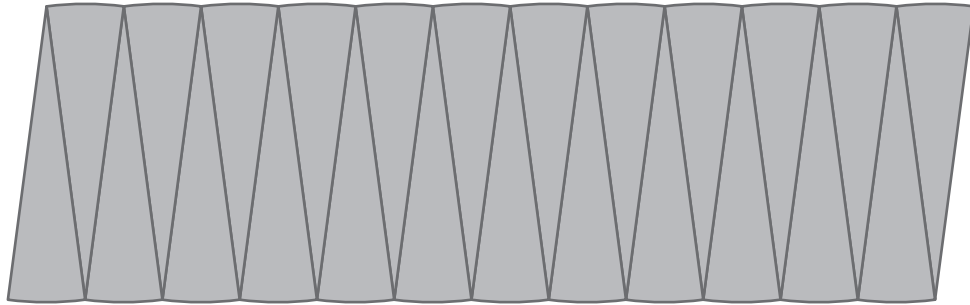
- Draw a circle. Label the radius as r .
- Divide the circle into 24 equal sections.



*Cut-outs are available in the back of the Record and Practice Journal.

8.3 Areas of Circles (continued)

- c. Cut the sections apart. Then arrange them to approximate a parallelogram.



- d. What is the approximate height and base of the parallelogram?

- e. Find the area of the parallelogram. What can you conclude?

What Is Your Answer?

3. **IN YOUR OWN WORDS** How can you find the area of a circle?

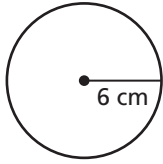
4. Write a formula for the area of a circle with radius r . Find an object that is circular. Use your formula to find the area.

8.3**Practice**

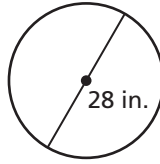
For use after Lesson 8.3

Find the area of the circle. Use 3.14 or $\frac{22}{7}$ for π .

1.

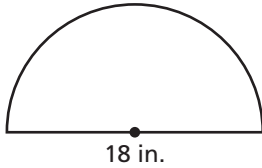


2.

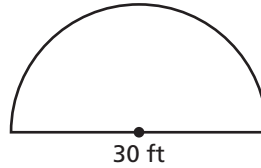


Find the area of the semicircle.

3.



4.



5. An FM radio station signal travels in a 40-mile radius. An AM radio station signal travels in a 4-mile radius. How much more area does the FM station cover than the AM station?

8.4

Areas of Composite Figures

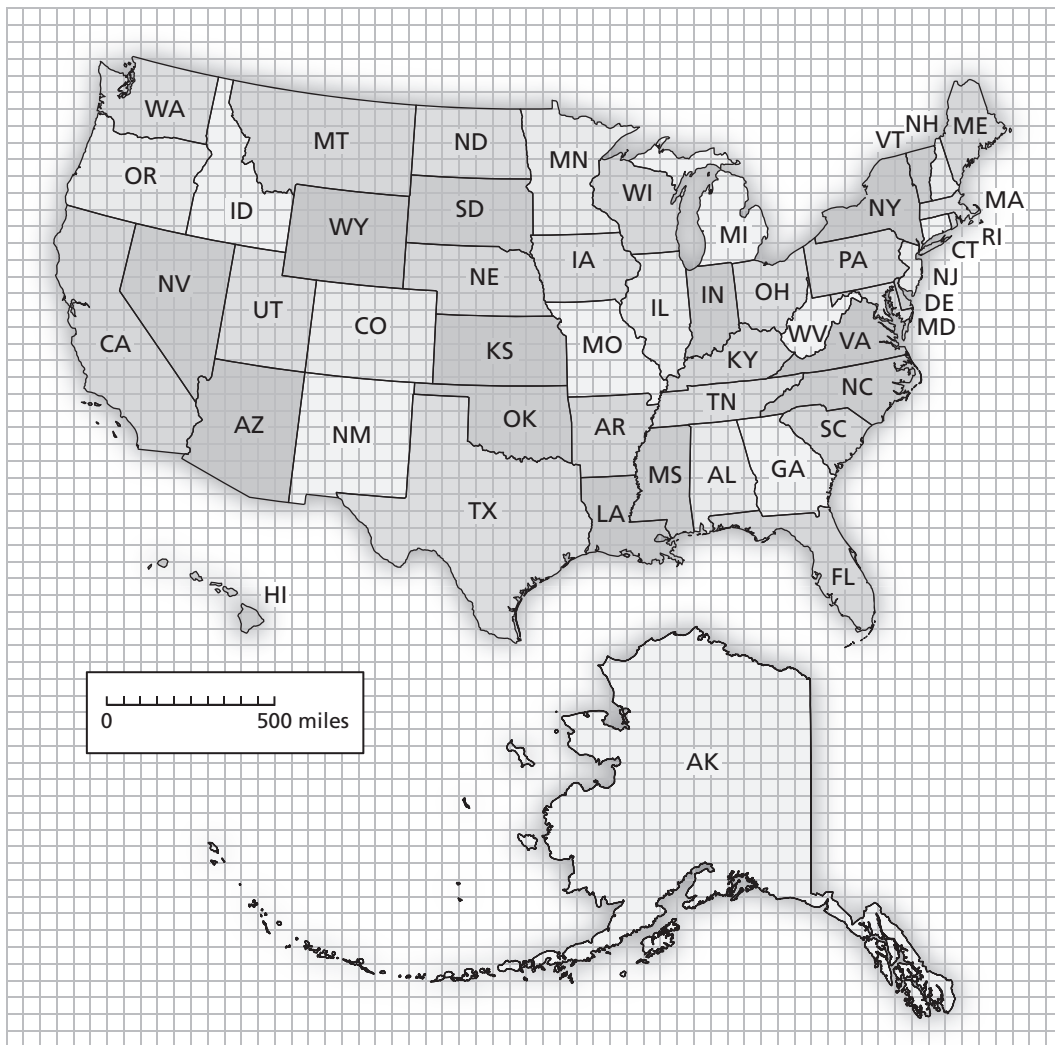
For use with Activity 8.4

Essential Question How can you find the area of a composite figure?

1 ACTIVITY: Estimating Area

Work with a partner.

- Choose a state. On grid paper, draw a larger outline of the state.
- Use your drawing to estimate the area (in square miles) of the state.
- Which state areas are easy to find? Which are difficult? Why?

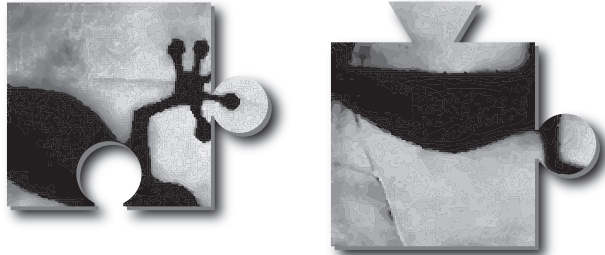


8.4 Areas of Composite Figures (continued)

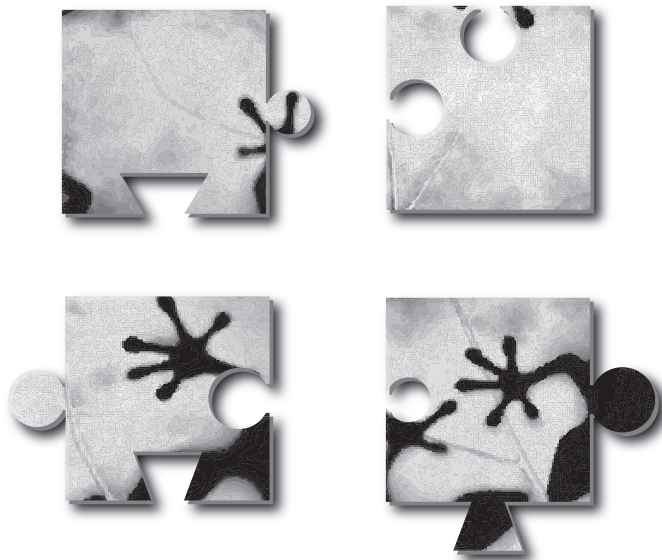
2 ACTIVITY: Estimating Areas

Work with a partner. The completed puzzle has an area of 150 square centimeters.*

a. Estimate the area of each puzzle piece.

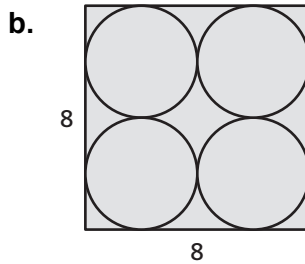
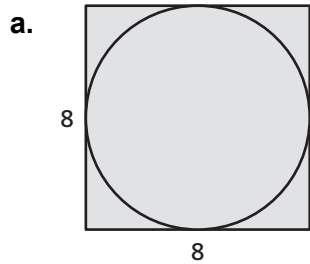


b. Check your work by adding the six areas. Why is this a check?



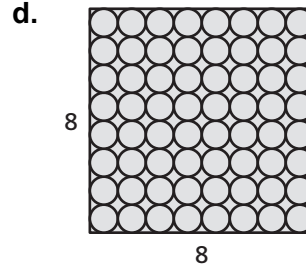
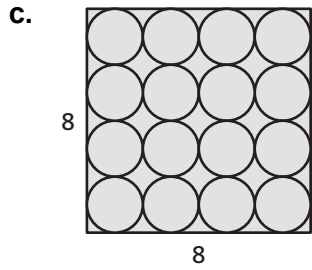
3 ACTIVITY: Filling a Square with Circles

Work with a partner. Which pattern fills more of the square with circles? Explain.



*Cut-outs are available in the back of the Record and Practice Journal.

8.4 Areas of Composite Figures (continued)



What Is Your Answer?

4. **IN YOUR OWN WORDS** How can you find the area of a composite figure?

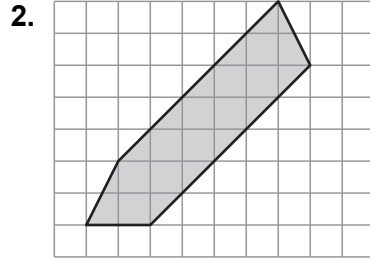
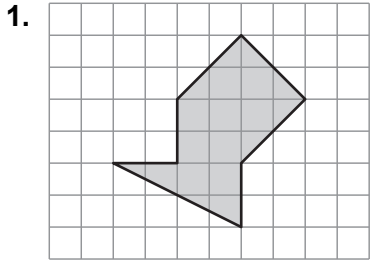
5. Summarize the area formulas for all the basic figures you have studied. Draw a single composite figure that has each type of basic figure. Label the dimensions and find the total area.

8.4

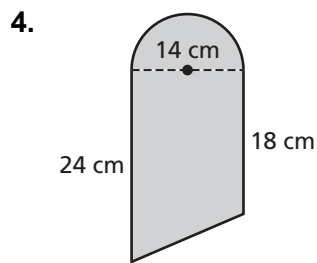
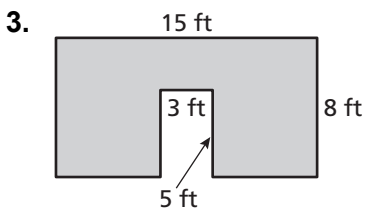
Practice

For use after Lesson 8.4

Find the area of the figure.



Find the area of the figure.



5. The diagram shows the shape of the green of a miniature golf hole. What is the area of the green?

