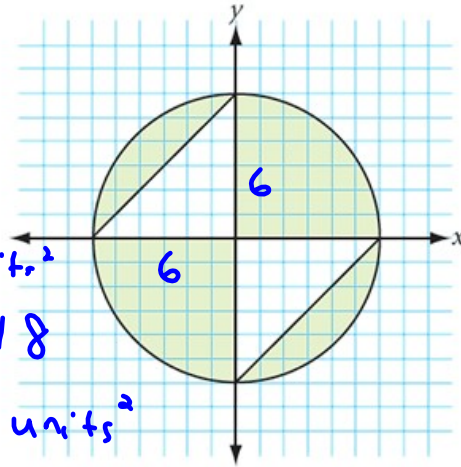


Warm Up:

You will need your  
Geometry textbook!

Find the area of the shaded region.  
(exact answer)

$$\begin{aligned} \text{Area of circle: } & 36\pi \text{ units}^2 \\ \text{Area of 1 triangle: } & \frac{1}{2} \cdot 6 \cdot 6 = 18 \\ \text{Area of 2 triangles} & = 36 \text{ units}^2 \\ & 36\pi - 36 \text{ units}^2 \end{aligned}$$



Lesson 8.3 Areas of Circles a

LESSON

8.3

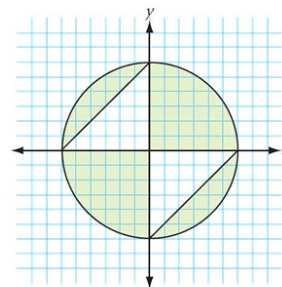
## Areas of Circles and Regular Polygons

### Extra Example

ANSWER

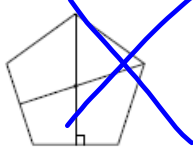
Find the area of the shaded region.

$$36\pi - 36$$

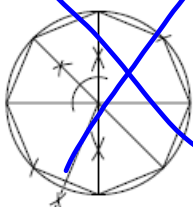


LESSON 8.3 • Areas of Circles and Regular Polygons

1.  $A \approx 696 \text{ cm}^2$       2.  $a \approx 7.8 \text{ cm}$   
 3.  $p \approx 43.6 \text{ cm}$       4.  $n = 10$   
 5.  $s = 4 \text{ cm}$ ,  $a \approx 2.8 \text{ cm}$ ,  $A \approx 28 \text{ cm}^2$



6. Possible answer ( $s$  will vary):  $s \approx 3.1 \text{ cm}$ ,  $a \approx 3.7 \text{ cm}$ ,  
 $A \approx 45.9 \text{ cm}^2$



7. Approximately  $31.5 \text{ cm}^2$ : area of square = 36; area of square within angle =  $\frac{3}{8} \cdot 36 = 13.5$ ; area of octagon  $\approx 120$ ; area of octagon within angle  $\approx \frac{3}{8} \cdot 120 \approx 45$ ; shaded area  $\approx 45 - 13.5 \approx 31.5 \text{ cm}^2$

8.  $81\pi \text{ cm}^2$       9.  $10.24\pi \text{ cm}^2$       10. 23 cm  
 11.  $324\pi \text{ cm}^2$       12. 191.13  $\text{cm}^2$       13. 41.41 cm  
 14.  $7.65 \text{ cm}^2$       15.  $4.90 \text{ cm}^2$       16.  $51.3 \text{ cm}^2$   
 17. 33.5 or  $33.6 \text{ cm}^2$   
 18.  $(64\pi - 128)$  square units  
 19.  $25\pi \text{ cm}^2$



Workbook p. 59: #2

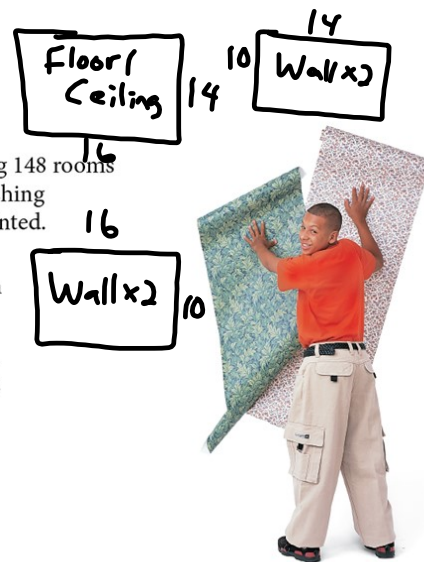
# Assignment:

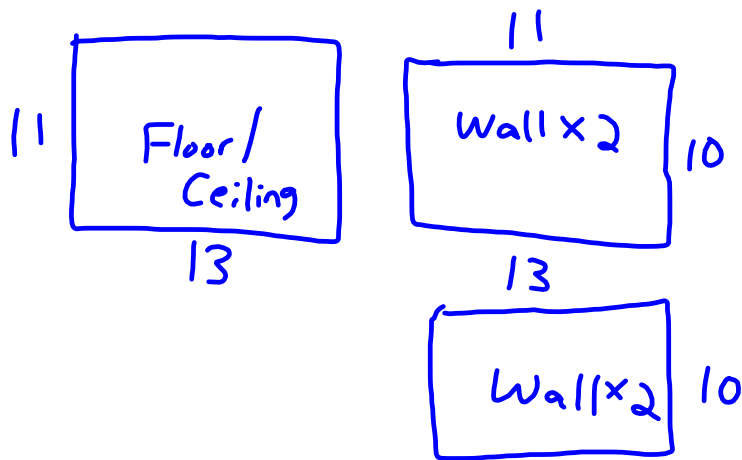
Pg. 416-417 in Textbook: 1-10

## 8.2 Exercises

pages 416 – 418

1. Tammy is estimating how much she should charge for painting 148 rooms in a new hotel with one coat of base paint and one coat of finishing paint. The four walls and the ceiling of each room must be painted. Each room measures 14 ft by 16 ft by 10 ft.
  - a. Calculate the total area of all the surfaces to be painted with each coat. Ignore doors and windows.
  - b. One gallon of base paint covers 500 square feet. One gallon of finishing paint covers 250 square feet. How many gallons of each will Tammy need for the job?
  
2. Rashad wants to wallpaper the four walls of his bedroom. The room is rectangular and measures 11 feet by 13 feet. The ceiling is 10 feet high. A roll of wallpaper at the store is 2.5 feet wide and 50 feet long. How many rolls should he buy? (Wallpaper is hung from ceiling to floor. Ignore doors and windows.)





## 8.2 Exercises

pages 416 – 418

3. It takes 65,000 solar cells, each 1.25 in. by 2.75 in., to power the Helios Prototype, shown at right. How much surface area, in square feet, must be covered with the cells? The cells on Helios are 18% efficient. Suppose they were only 12% efficient, like solar cells used in homes. How much more surface area would need to be covered to deliver the same amount of power?

### Technology CONNECTION



In August 2001, the Helios Prototype, a remotely controlled, nonpolluting solar-powered aircraft, reached 96,500 feet—a record for nonrocket aircraft.

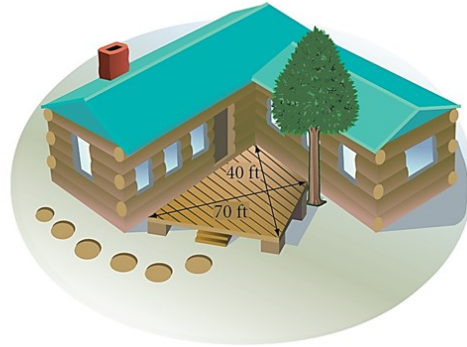
$$\frac{2}{3}x = 1$$

$$x = 1.5$$

## 8.2 Exercises

pages 416 – 418

4. Harold works at a state park. He needs to seal the redwood deck at the information center to protect the wood. He measures the deck and finds that it is a kite with diagonals 40 feet and 70 feet. Each gallon of sealant covers 400 square feet, and the sealant needs to be applied every six months. How many gallon containers should he buy to protect the deck for the next three years?



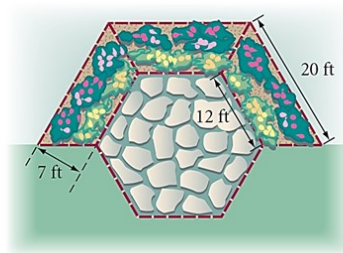
Discovering Geometry  
©2015 Kendall Hunt Publishing

Lesson 8.2 Applications of Area

## 8.2 Exercises

pages 416 – 418

5. A landscape architect is designing three trapezoidal flowerbeds to wrap around three sides of a hexagonal flagstone patio, as shown. What is the area of the entire flowerbed? The landscape architect's fee is \$300 plus \$5 per square foot. What will the flowerbed cost?



Discovering Geometry  
©2015 Kendall Hunt Publishing

### Career CONNECTION

Landscape architects have a keen eye for natural beauty. They study the grade and direction of land slopes, stability of the soil, drainage patterns, and existing structures and vegetation. They use science and engineering to plan environments that harmonize land features with structures, reducing the impact of urban development upon nature.



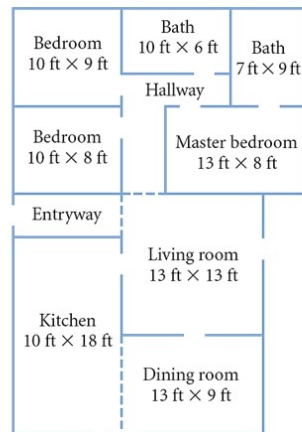
Lesson 8.2 Applications of Area

## 8.2 Exercises

pages 416 – 418

For Exercises 6 and 7, refer to the floor plan at right.

6. Daren's family is ready to have wall-to-wall carpeting installed. The carpeting they chose costs \$14 per square yard, the padding \$3 per square yard, and the installation \$3 per square yard. What will it cost them to carpet the three bedrooms and the hallway shown?  $\text{h}$
7. Daren's family now wants to install 1-foot-square terra-cotta tiles in the entryway and kitchen, and 4-inch-square blue tiles on each bathroom floor. The terra-cotta tiles cost \$5 each, and the bathroom tiles cost 45¢ each. How many of each kind will they need? What will all the tiles cost?



## 8.2 Exercises

pages 416 – 418

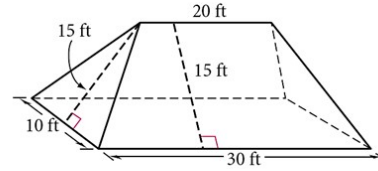
8. Sarah is tiling a wall in her bathroom. It is rectangular and measures 4 feet by 7 feet. The tiles are square and measure 6 inches on each side. How many tiles does Sarah need?  $\text{h}$



## 8.2 Exercises

pages 416 – 418

9. The roof on Crystal's house is formed by two congruent trapezoids and two congruent isosceles triangles, as shown. She wants to put new wood shingles on her roof. Each shingle will cover 0.25 square foot of area. (The shingles are 1 foot by 1 foot, but they overlap by 0.75 square foot.) How many shingles should Crystal buy?
10. Three college students are planning to share a 3-bedroom 1-bath apartment near the campus. The rent is \$1,475 per month. The three bedrooms measure 12 ft by 10 ft, 10 ft by 12 ft, and 12 ft by 12 ft 6 in. How should they fairly divide the cost of the rent? Explain your reasoning.



### ANSWERS

## 8.2 Exercises

1. Tammy is estimating how much she should charge for painting 148 rooms in a new hotel with one coat of base paint and one coat of finishing paint. The four walls and the ceiling of each room must be painted. Each room measures 14 ft by 16 ft by 10 ft.
- Calculate the total area of all the surfaces to be painted with each coat. Ignore doors and windows. **121,952 ft<sup>2</sup>**
  - One gallon of base paint covers 500 square feet. One gallon of finishing paint covers 250 square feet. How many gallons of each will Tammy need for the job? **244 gal of base paint and 488 gal of finishing paint**
2. Rashad wants to wallpaper the four walls of his bedroom. The room is rectangular and measures 11 feet by 13 feet. The ceiling is 10 feet high. A roll of wallpaper at the store is 2.5 feet wide and 50 feet long. How many rolls should he buy? (Wallpaper is hung from ceiling to floor. Ignore doors and windows.) **He should buy at least four rolls of wallpaper. (The area of each roll is 125 ft<sup>2</sup>. The total surface area to be papered is 480 ft<sup>2</sup>.) If paper cut off at the corners is wasted, he'll need 5 rolls.**



## ANSWERS

## 8.2 Exercises

3. It takes 65,000 solar cells, each 1.25 in. by 2.75 in., to power the Helios Prototype, shown at right. How much surface area, in square feet, must be covered with the cells? The cells on Helios are 18% efficient. Suppose they were only 12% efficient, like solar cells used in homes. How much more surface area would need to be covered to deliver the same amount of power?

1552 ft<sup>2</sup>

776 ft<sup>2</sup> more surface area

Technology  
CONNECTION



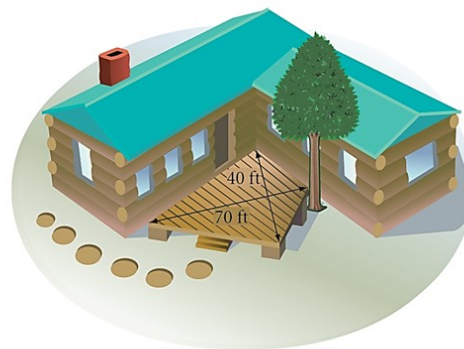
In August 2001, the Helios Prototype, a remotely controlled, nonpolluting solar-powered aircraft, reached 96,500 feet—a record for nonrocket aircraft.

## ANSWERS

## 8.2 Exercises

4. Harold works at a state park. He needs to seal the redwood deck at the information center to protect the wood. He measures the deck and finds that it is a kite with diagonals 40 feet and 70 feet. Each gallon of sealant covers 400 square feet, and the sealant needs to be applied every six months. How many gallon containers should he buy to protect the deck for the next three years?

21 gallons

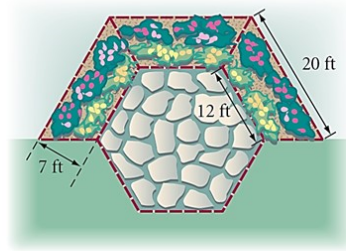




ANSWERS

8.2 Exercises

5. A landscape architect is designing three trapezoidal flowerbeds to wrap around three sides of a hexagonal flagstone patio, as shown. What is the area of the entire flowerbed? The landscape architect's fee is \$300 plus \$5 per square foot. What will the flowerbed cost?



336 ft<sup>2</sup>

\$1980

Career CONNECTION

Landscape architects have a keen eye for natural beauty. They study the grade and direction of land slopes, stability of the soil, drainage patterns, and existing structures and vegetation. They use science and engineering to plan environments that harmonize land features with structures, reducing the impact of urban development upon nature.



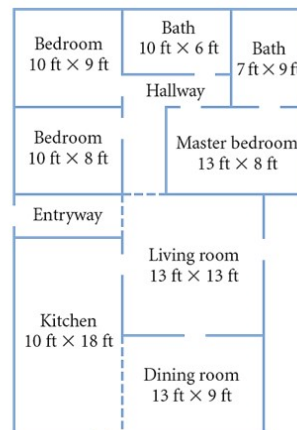
Lesson 8.2 Applications of Area

ANSWERS

8.2 Exercises

For Exercises 6 and 7, refer to the floor plan at right.

6. Daren's family is ready to have wall-to-wall carpeting installed. The carpeting they chose costs \$14 per square yard, the padding \$3 per square yard, and the installation \$3 per square yard. What will it cost them to carpet the three bedrooms and the hallway shown?  $\text{\$760}$
7. Daren's family now wants to install 1-foot-square terra-cotta tiles in the entryway and kitchen, and 4-inch-square blue tiles on each bathroom floor. The terra-cotta tiles cost \$5 each, and the bathroom tiles cost 45¢ each. How many of each kind will they need? What will all the tiles cost?



220 terra cotta tiles, 1107 blue tiles; \$1598.15

## ANSWERS

## 8.2 Exercises

8. Sarah is tiling a wall in her bathroom. It is rectangular and measures 4 feet by 7 feet. The tiles are square and measure 6 inches on each side. How many tiles does Sarah need? *h*

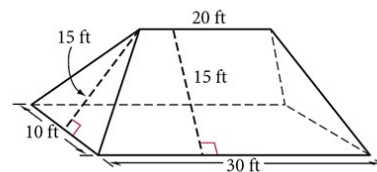
112 tiles



## ANSWERS

## 8.2 Exercises

9. The roof on Crystal's house is formed by two congruent trapezoids and two congruent isosceles triangles, as shown. She wants to put new wood shingles on her roof. Each shingle will cover 0.25 square foot of area. (The shingles are 1 foot by 1 foot, but they overlap by 0.75 square foot.) How many shingles should Crystal buy?
- 3600 shingles (to cover an area of 900 ft<sup>2</sup>)
10. Three college students are planning to share a 3-bedroom 1-bath apartment near the campus. The rent is \$1,475 per month. The three bedrooms measure 12 ft by 10 ft, 10 ft by 12 ft, and 12 ft by 12 ft 6 in. How should they fairly divide the cost of the rent? Explain your reasoning.



Since the rest of the house is common space, use the size of the bedrooms to divide the cost of the rent. The three bedrooms total 390 square feet. Dividing the rent by 390 and multiplying by the number of square feet in each bedroom means two of them will pay \$454 per month and one will pay \$567 per month.