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Focus Lesson

Area is the amount of space inside a figure or shape. It is measured in **square units**. The **area formulas** for some common geometric shapes are shown below.

Area of a **triangle** = $\frac{1}{2} \times \text{base} \times \text{height} = \frac{1}{2}bh$

Area of a **rectangle** = length \times width = lw

Area of a **parallelogram** = base \times height = bh

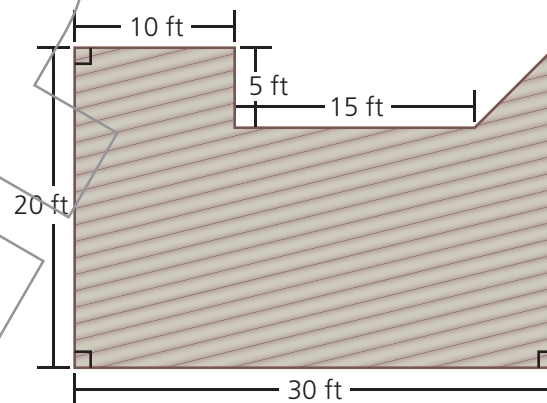
Area of a **trapezoid** = $\frac{1}{2}(\text{base}_1 + \text{base}_2) \times \text{height} = \frac{1}{2}(b_1 + b_2)h$

To find the area of some figures, they need to be **decomposed**, or broken down into smaller shapes with known formulas. The areas of the smaller shapes are added together to find the area of the entire figure.



Lewis's deck is represented in the diagram at the right. What is the area of Lewis's deck?

_____ square feet



- 1 If the deck were decomposed using rectangles and triangles, what is the fewest number of rectangles there would be? _____
The fewest number of triangles? _____
- 2 Draw lines on the diagram to decompose the figure as described in question 1.
- 3 What is the formula for the area of a rectangle? _____ Of a triangle? _____
- 4 What are the dimensions of the rectangle or rectangles the deck can be divided into?

- 5 What are the dimensions of the triangle or triangles the deck can be divided into?

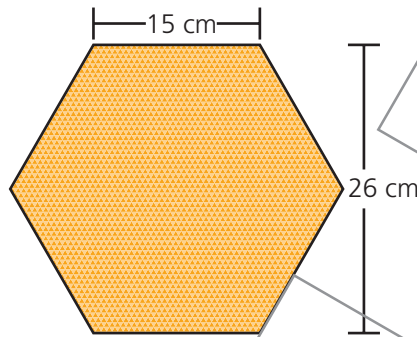
- 6 What are the areas, in square feet, of each rectangle and triangle the deck is divided into?

What is the area, in square feet, of Lewis's deck?



Guided Practice

The bottom of a fish tank is in the shape of a regular hexagon like the one shown below.



Circle an option from the set to make the sentence below true.

The area of the bottom of the fish tank is [less than 500, between 500 and 550, between 550 and 600, between 600 and 650, between 650 and 700, greater than 700] square centimeters.

- 1 If the hexagon is divided into triangles that are all the same size, how many triangles will there be?

Let each side of the hexagon represent the base of a triangle.

1 1 1 1 1 1

- 2 What are the lengths of the base and the height of each of those triangles?

How is the height of one triangle related to the height of the hexagon?

2 2 2 2 2 2

Which measurement describes the area, in square centimeters, of the bottom of the fish tank?





Independent Practice

Solve the following problems.

- 1 A triangular sign is shown below.



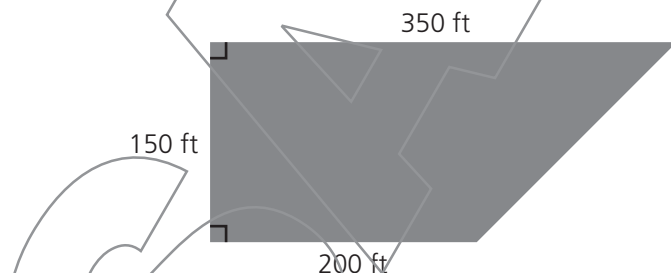
What is the area, in square centimeters, of this sign?

_____ square centimeters

- 2 One leg of a right triangle is half the length of the other leg. One leg has a length of 10 meters. What could be the area, in square meters, of this triangle? Select all that apply.

- A 25 m²
- B 50 m²
- C 100 m²
- D 150 m²
- E 200 m²

- 3 The diagram below shows the dimensions of a parking lot.



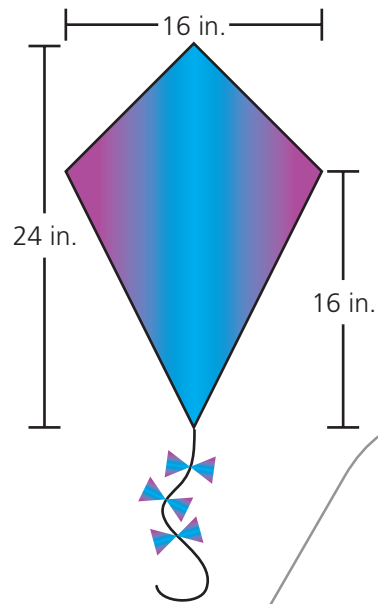
What is the area, in square feet, of the parking lot?

_____ square feet



Independent Practice

- 4 The dimensions of a kite are shown in the figure below.



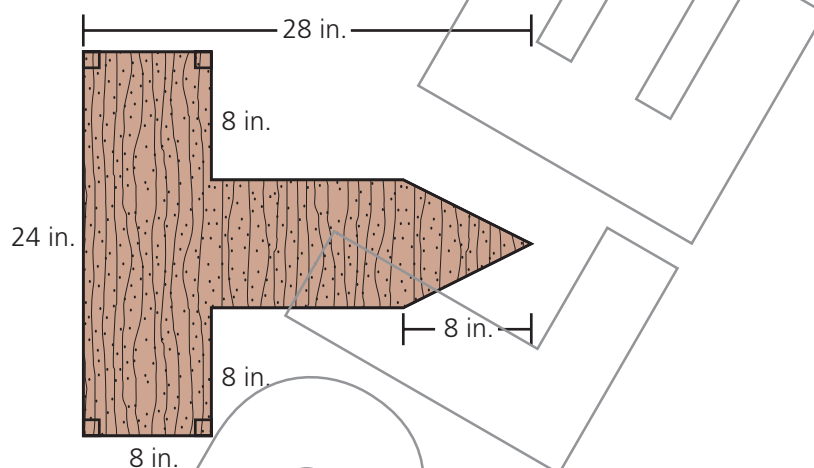
Which expressions can be used to find the area, in square inches, of the kite?
Select all that apply.

- A** 24×16
- B** $\frac{1}{2} \times (8 \times 24)$
- C** $2 \times \left(\frac{1}{2} \times 8 \times 24\right)$
- D** $8 \times 16 + 16 \times 16$
- E** $2 \times (8 \times 16) + 2 \times (16 \times 16)$
- F** $\frac{1}{2} \times (8 \times 16) + \frac{1}{2} \times (16 \times 16)$



Independent Practice

- 5 Christopher is making a shape out of a piece of wood. The diagram below represents the dimensions of his woodworking project.

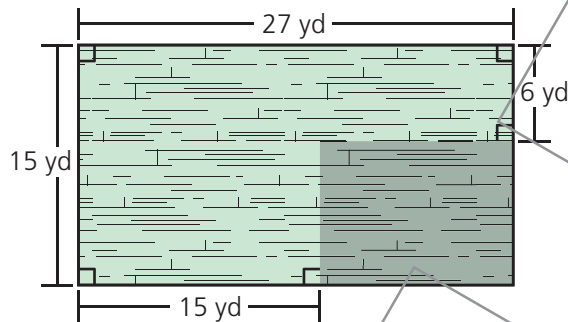


Which of the following sets of shapes can the diagram of the woodworking project be divided into? Select all that apply.

- A Two rectangles
- B A rectangle and two squares
- C Two rectangles and a triangle
- D Three triangles and a rectangle
- E Two squares and two rectangles
- F Two triangles and two rectangles
- G A triangle, a rectangle, and two squares

Independent Practice

- 6 The diagram below shows the dimensions of an office floor.



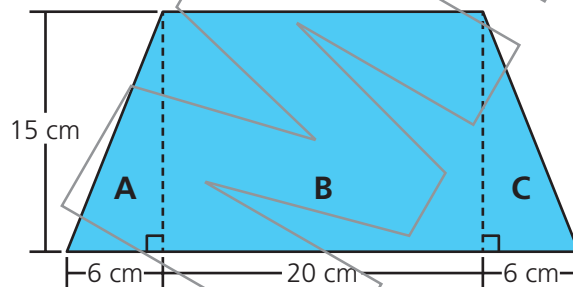
The rectangular area marked by the shaded region is space used for storage.

What are the dimensions of the space used for storage?

Length _____ yards

Width _____ yards

- 7 The figure below is divided into three shapes, labeled A, B, and C.



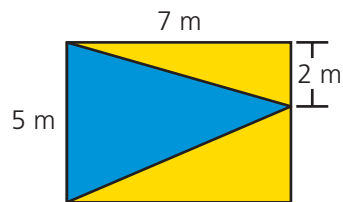
Which statements regarding this figure are true? Select all that apply.

- A** The area of shape A is 90 square centimeters.
- B** The area of shape B is 300 square centimeters.
- C** The area of shape A is the same as the area of shape C.
- D** The area of shape B is more than 4 times greater than the area of shape A.
- E** The area of shape B is more than 4 times greater than the areas of shapes A and C combined.



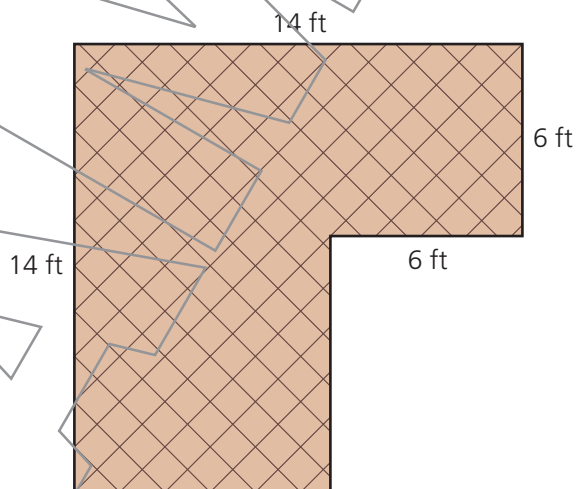
Independent Practice

- 8 The rectangle below is made up of one blue triangle and two yellow triangles.



Which statements are true of the area of the blue rectangle? Select all that apply.

- A It is equal to 70 square meters.
 - B It is equal to 35 square meters.
 - C It is equal to 17.5 square meters.
 - D It is less than the areas of both yellow triangles.
 - E It is the same as the areas of both yellow triangles.
 - F It is greater than the areas of both yellow triangles.
- 9 New tile will be put in Mr. Munson's kitchen. The area of the floor to be covered with tile is represented by the diagram below.



Fill in the blanks in the equation below to show the steps used to calculate the area, in square feet, of the floor to be covered with tile.

$$(14 \text{ feet} \times \underline{\hspace{2cm}} \text{ feet}) + (6 \text{ feet} \times \underline{\hspace{2cm}} \text{ feet}) = \underline{\hspace{2cm}} \text{ square feet}$$