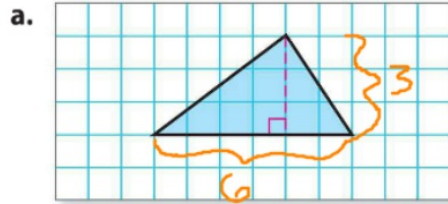


$n = 30.72$

Divide:  $\frac{1}{2}(11.44) = 11.44 \div 2 = 5.72$

The area of the triangle is 38.72 square meters.

**Got It?** Do these problems to find out.



$$24 = \frac{b \cdot 6}{2}$$

Area of a triangle

Replace  $A$  with 24 and  $h$  with 6.

$$24(2) = \frac{b \cdot 6}{2}(2)$$

Multiply each side by 2.

$$48 = b \cdot 6$$

Simplify.

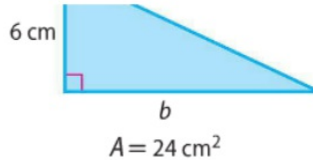
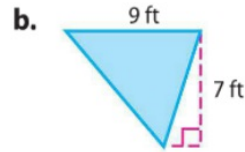
$$\frac{48}{6} = \frac{b \cdot 6}{6}$$

Divide each side by 6.

$$8 = b$$

Simplify.

So, the base is 8 centimeters.



$$A = \frac{1}{2} b h$$

$$72 = \frac{1}{2} (12) h$$

$$72 = 6 h$$

Show your work.

$$6 \times 3 = 18 \div 2 = 9$$

a. 9 units<sup>2</sup>

$$9 \times 7 = 63 \div 2$$

b. 31.5 ft<sup>2</sup>

c.  $A = \frac{1}{2} b h$

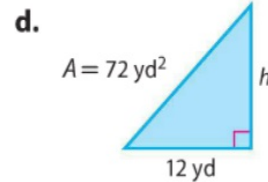
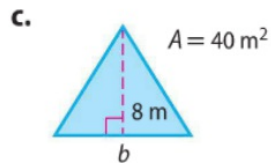
$$40 = \frac{1}{2} b (8)$$

$$40 = 4 \underline{b}$$

c. 10 m

d. 12 yd

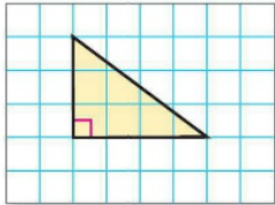
**Got It?** Do these problems to find out.



# Guided Practice

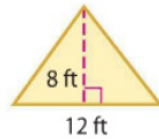
Find the area of each triangle. (Examples 1 and 2)

1. **6 units<sup>2</sup>**

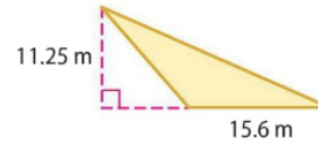


Show your work.

2. **48 ft<sup>2</sup>**

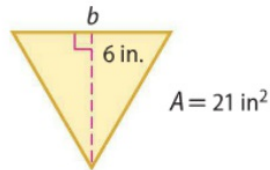


3. **87.75 m<sup>2</sup>**



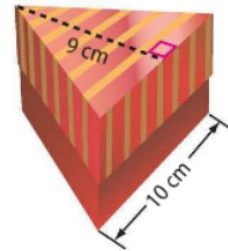
4. Tayshan designs uniquely-shaped ceramic floor tiles. What is the base of the tile shown? (Example 3)

**7 in.**



5. Consuela made a triangular paper box as shown. What is the area of the top of the box? (Example 4)

**45 cm<sup>2</sup>**



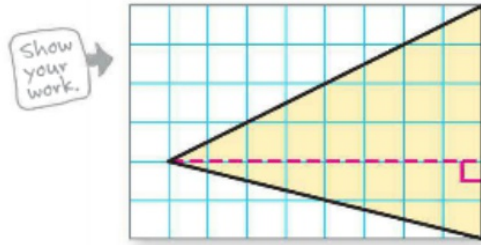
6. **e** **Building on the Essential Question** How is the formula for the area of a triangle related to the formula for the area of a parallelogram?

**Sample answer: A parallelogram can be decomposed into two congruent triangles. So, the formula for the area of a triangle,  $A = \frac{1}{2}bh$ , is one-half the area of a parallelogram,  $A = bh$ .**

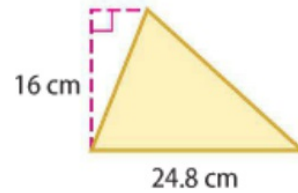
# Independent Practice

Find the area of each triangle. (Examples 1 and 2)

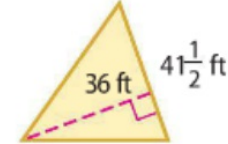
1. **24 units<sup>2</sup>**



2. **198.4 cm<sup>2</sup>**



3. **747 ft<sup>2</sup>**

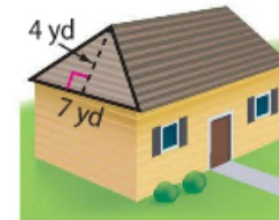


Find the missing dimension of each triangle described. (Example 3)

4. height: 14 in.  
area: 245 in<sup>2</sup>  
**35 in.**

5. base: 27 cm  
area: 256.5 cm<sup>2</sup>  
**19 cm**

6. Ansley is going to help his father shingle the roof of their house. What is the area of the triangular portion of one end of the roof? (Example 4)  
**14 yd<sup>2</sup>**

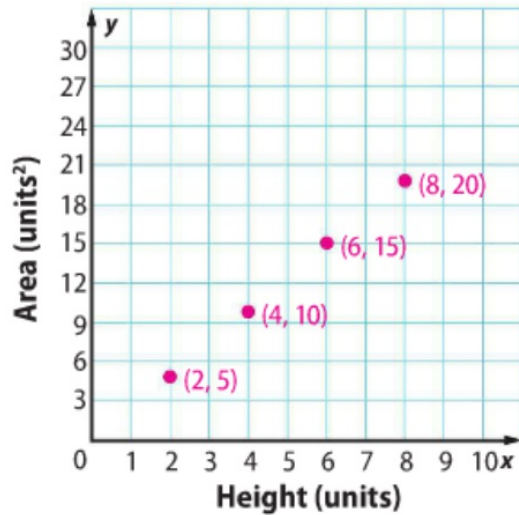




**Multiple Representations** The table shows the areas of a triangle where the base of the triangle stays the same but the height changes.

a. **Algebra** Write an algebraic expression that can be used to find the area of a triangle that has a base of 5 units and a height of  $x$  units.  $\frac{5x}{2}$

b. **Graph** Graph the ordered pairs (height, area).

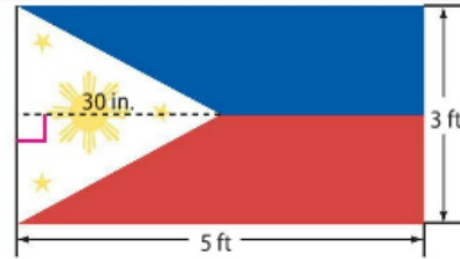


c. **Words** Describe the graph.

The points appear to form a line.

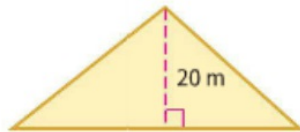
Area of Triangles		
Base (units)	Height (units), $x$	Area (units <sup>2</sup> ), $y$
5	2	5
5	4	10
5	6	15
5	8	20
5	$x$	?

8. What is the area of the triangle on the flag of the Philippines in inches? Explain your reasoning. **540 in<sup>2</sup>; Sample answer: The base of the triangle is 3 feet or 36 inches. The height is 30 inches. So, the area is  $\frac{1}{2}(36)(30)$  or 540 square inches.**



### H.O.T. Problems Higher Order Thinking

9. **CCSS Find the Error** Dwayne is finding the base of the triangle shown. Its area is 100 square meters. Find his mistake and correct it.



The formula is  $\frac{1}{2}bh$ , not  $bh$ .

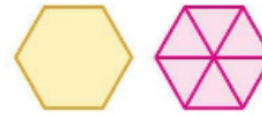
$$100 = \frac{b \cdot 20}{2}$$

$$b = 10 \text{ m}$$

$$\begin{aligned} 100 &= (b)20 \\ 100 &= 20b \\ 5 &= b \end{aligned}$$



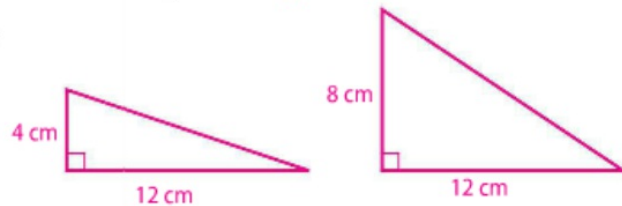
10. **CCSS Persevere with Problems** How can you use triangles to find the area of the hexagon shown? Draw a diagram to support your answer.



**Sample answer:** The hexagon is formed by six congruent triangles. If the hexagon is divided into six triangles, find the area of one triangle and multiply by 6.

11. **CCSS Identify Repeated Reasoning** Draw a triangle and label its base and height. Draw another triangle that has the same base, but a height twice that of the first triangle. Find the area of each triangle. Then write a ratio that expresses the area of the first triangle to the area of the second triangle. **Sample answer:**

Show your work.



**Area of first triangle is  $24 \text{ cm}^2$ ; Area of second triangle is  $48 \text{ cm}^2$ ;**

**$1:2$  or  $\frac{1}{2}$**

12. **CCSS Reason Inductively** The triangle shown has an area of  $8\frac{15}{16}$  square feet. What is the height, in inches?  **$39 \text{ in.}$**

