The **area** of a geometric object is a measurement of its surface.

While we could think about perimeter as a fencing problem, area can be thought of as follows. Suppose a geometric object is a room. How much rug do we need to buy to cover the entire room? Understanding and remembering the area formulas are easier if we know how they were derived.

Recall that the area of a rectangle with sides x and y is $A = xy$.

Theorem: The area of a right triangle with sides a, b, and c (where c is the longest side) is $A = \dfrac{ab}{2}$.
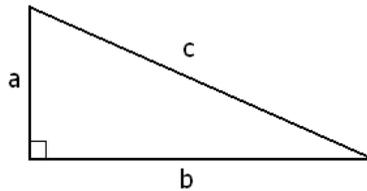
Proof: It is very easy to see that every right triangle is basically half of a rectangle. We can make a rectangle if we use two identical right triangles as shown on the picture below.
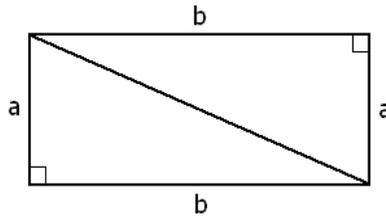
Since the rectangle's sides are a and b, its area is ab. The area of our triangle must be half of it. Thus $A = \dfrac{ab}{2}$.

Notice that we never used the length of the longest side, c.

Example 2: Find the area of the right triangle with sides $5\,\mathrm{m}$, $12\,\mathrm{m}$, and $13\,\mathrm{m}$ long.

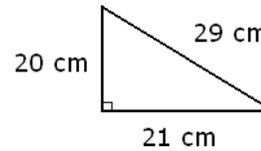Solution: It is important to know that the largest side, $13\,\mathrm{m}$ long, is not needed for this computation. With labeling $a = 5\,\mathrm{m}$ and $b = 12\,\mathrm{m}$, the area is

$$A = \frac{ab}{2} = \frac{5\,\mathrm{m}\,(12\,\mathrm{m})}{2} = \frac{60\,\mathrm{m}^2}{2} = 30\,\mathrm{m}^2$$

Practice Problems

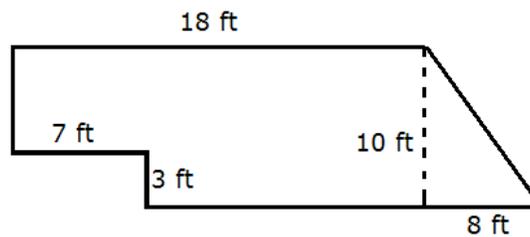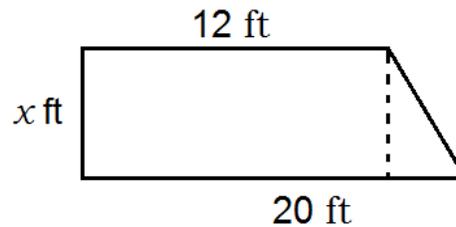1. Find the area of the right triangles shown on the picture below.
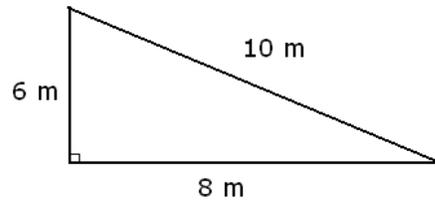
2. Find the area of the figure shown on the picture below. Include units in your answer.

3. Find the value of x based on the picture if we know that the area of the object on the picture is $64\,\text{ft}^2$.

Practice Problems - Answers

1. a) $A = 44\,\text{in}^2$ b) $A = 60\,\text{in}^2$

2. $199\,\text{ft}^2$

3. $x = 4$

       Last revised: September 14, 2016