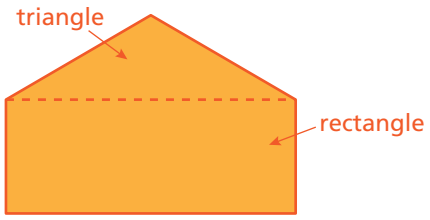
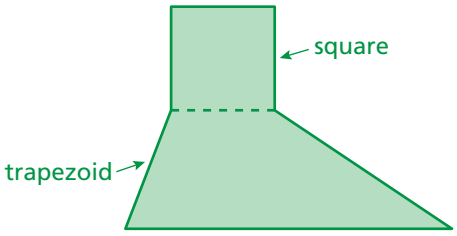
Extension 4.3 Areas of Composite Figures

Check It Out Lesson Tutorials BigIdeasMath.com

Key Vocabulary
composite figure, *p. 172*

A **composite figure** is made up of triangles, squares, rectangles, and other two-dimensional figures. Here are two examples.

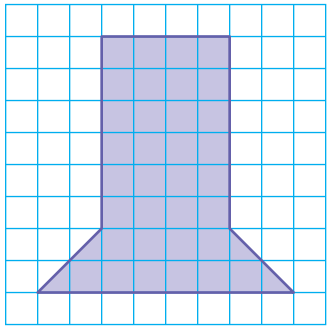




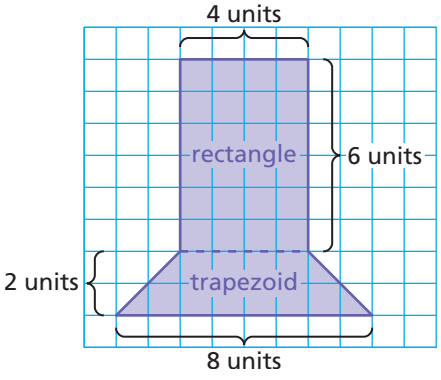
To find the area of a composite figure, separate it into figures with areas you know how to find. Then find the sum of the areas of those figures.

EXAMPLE 1 Finding the Area of a Composite Figure

Find the area of the purple figure.



You can separate the figure into a rectangle and a trapezoid. Count grid lines to find the dimensions of each figure. Then find the area of each figure.



Area of Rectangle

$A = \ell w$

$= 6(4)$

$= 24$

Area of Trapezoid

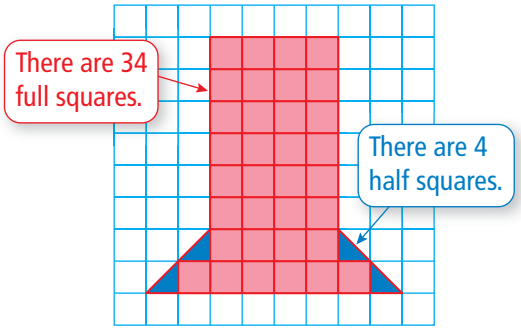
$A = \frac{1}{2}h(b_1 + b_2)$

$= \frac{1}{2}(2)(4 + 8)$

$= 12$

∴ So, the area of the purple figure is $24 + 12 = 36$ square units.

Reasonable? You can check your result by counting unit squares.



Full squares: 34

Half squares: 4

The area is

$$34(1) + 4\left(\frac{1}{2}\right) = 36 \text{ square units.}$$

So, the answer is reasonable. ✓

Study Tip

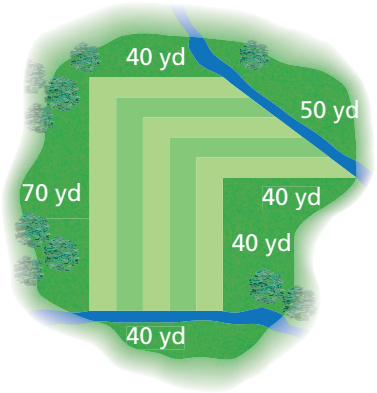
There is often more than one way to separate composite figures. In Example 1, you can separate the figure into one rectangle and two triangles.

Geometry

In this extension, you will
- find areas of composite figures.
- solve real-life problems.

Multi-Language Glossary at BigIdeasMath.com

EXAMPLE 2 Real-Life Application

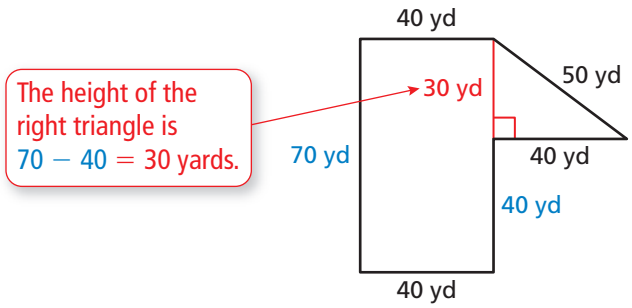


STEM VIDEO

Find the area of the fairway between two streams on a golf course.

There are several ways to separate the fairway into figures whose areas you can find using formulas. It appears that one way is to separate it into a right triangle and a rectangle.

Identify each shape and find any missing dimensions.

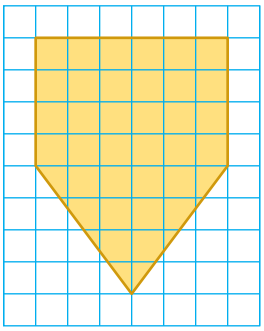


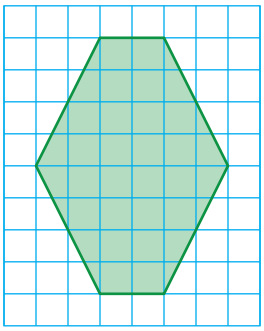
Area of Rectangle	*Area of Right Triangle*
$A = \ell w$	$A = \frac{1}{2}bh$
$= 70(40)$	$= \frac{1}{2}(40)(30)$
$= 2800$	$= 600$

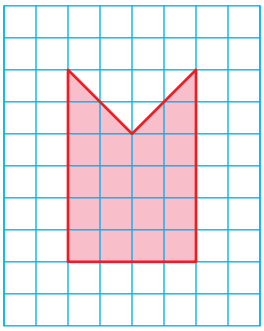
∴ So, the area of the fairway is $2800 + 600 = 3400$ square yards.

Practice

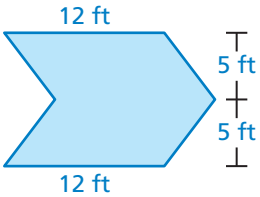
Find the area of the shaded figure.

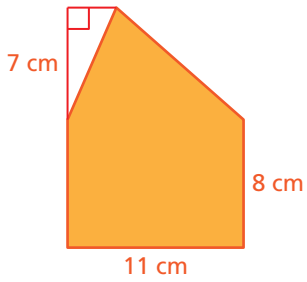
1. 

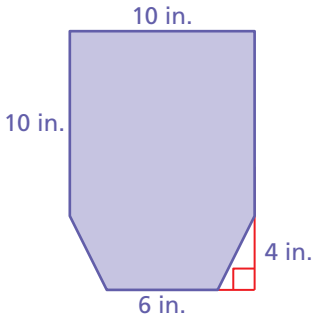
2. 

3. 

Find the area of the figure.

4. 

5. 

6. 

7. **ANOTHER METHOD** Find the area in Example 2 using a different method.