

Geometry

8.6: Area of Trapezoids

Name: _____

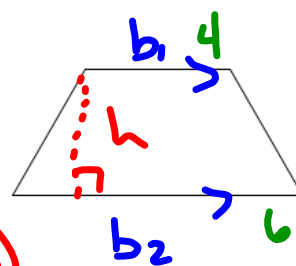
Remember...

Bases of a trapezoid:

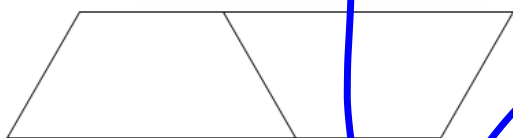
parallel sides

Height of a trapezoid:

Shortest distance
between bases (right angle)



If you start with any trapezoid and put two of the same trapezoid together, what do you make?



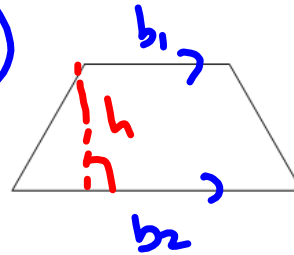
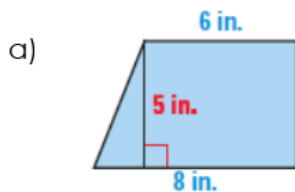
What is the area of this figure?

So what is the area of just 1 trapezoid?

Area of a Trapezoid

$$\text{Area} = \text{height} \left(\frac{\text{base}_1 + \text{base}_2}{2} \right)$$

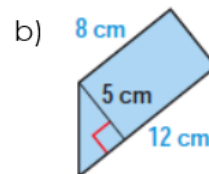
$$A = \frac{h(b_1 + b_2)}{2}$$

**Example 1:** Find the area of the trapezoid.

$$A = \frac{5(6+8)}{2}$$

$$A = \frac{5(14)}{2}$$

$$A = 35 \text{ in}^2$$

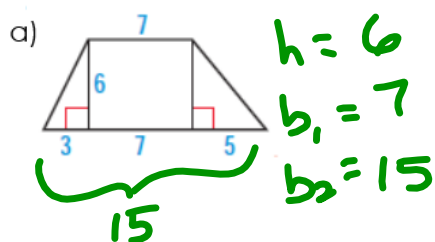


$$A = \frac{5(8+12)}{2}$$

$$A = \frac{5(20)}{2} = 10$$

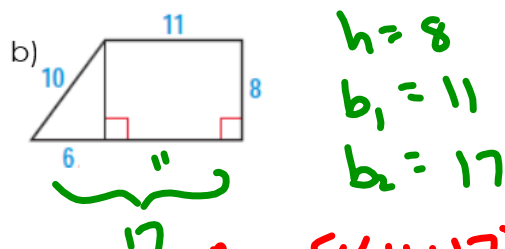
$$A = 50 \text{ cm}^2$$

Example 2: Find the height and lengths of the bases of each trapezoid. Then find the area.



$$A = \frac{6(7+15)}{2} \quad A = \frac{6(22)}{2}$$

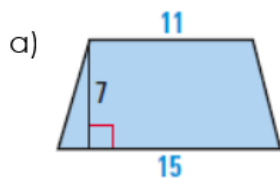
$$A = 66u^2$$



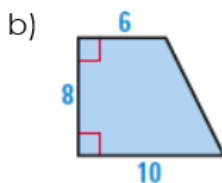
$$A = \frac{8(11+17)}{2}$$

$$A = \frac{8(28)}{2} = 112u^2$$

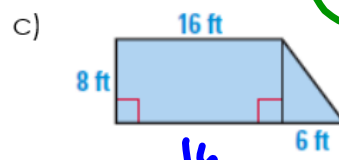
Try: Find the area of the trapezoid.



$$91u^2$$



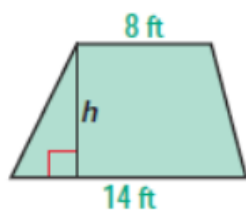
$$64u^2$$



$$152 \text{ ft}^2$$

Example 3: Find the height for each trapezoid.

a) area = 77 ft²



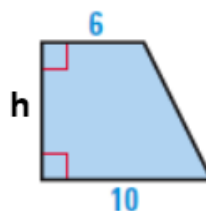
$$A = \frac{h(b_1 + b_2)}{2}$$

$$77 = \frac{h(8 + 14)}{2}$$

$$77 = \frac{h(22)}{2}$$

$$\begin{array}{r} 77 = 11h \\ \hline 11 \quad \hline 7ft = h \end{array}$$

b) area = 64 square units



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

$$64 = \frac{h(6 + 10)}{2}$$

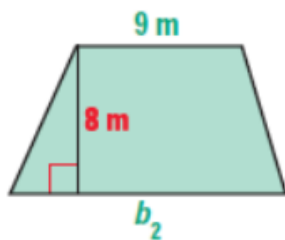
$$2 \cdot 64 = \frac{h(16)}{2}$$

$$\frac{128}{16} = \frac{16h}{16}$$

$$8u = h$$

Example 4: Find the value of b_2 for each trapezoid.

a) area = 96 m^2



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

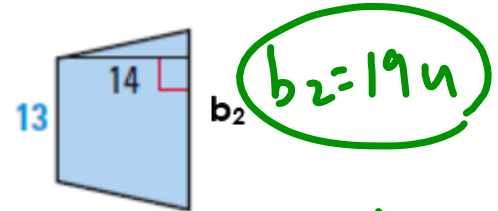
$$96 = \frac{8(9 + b_2)}{2}$$

$$96 = 4(9 + b_2)$$

$$24 = 9 + b_2$$

$$15 \text{ m} = b_2$$

b) area = 224 square units



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

$$224 = \frac{14(13 + b_2)}{2}$$

$$224 = 7(13 + b_2)$$

$$224 = 91 + 7b_2$$

$$\begin{array}{r} 224 = 91 + 7b_2 \\ - 91 \quad - 91 \\ \hline 133 = 7b_2 \\ \frac{133}{7} = \frac{7b_2}{7} \end{array}$$