

## Quadratic Word Problems

1. One base of a trapezoid is three times the length of the second base. The height of the trapezoid is 2 *in.* smaller than the second base. If the area of the trapezoid is  $30 \text{ in}^2$ , find the lengths of the bases and the height of the trapezoid.

2. A student is painting an accent wall in his room where the length of the wall is 3 *ft.* more than its width. The wall has an area of  $130 \text{ ft}^2$ . What are the length and the width, in feet?

3. Find two consecutive even integers whose product is 80. (There are two pairs, and only an algebraic solution will be accepted.)

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$$\begin{aligned}A &= \frac{1}{2}(b_1 + b_2)h \\30 &= \frac{1}{2}(3b_2 + b_2)(b_2 - 2) \\30 &= (2b_2)(b_2 - 2) \\2b_2^2 - 4b_2 - 30 &= 0 \\2(b_2 - 5)(b_2 + 3) &= 0 \\b_2 &= 5 \text{ or } -3\end{aligned}$$

*However, only the positive value makes sense. The first base is 15 in.; the second base is 5 in.; and the height is 3 in.*

2. A student is painting an accent wall in his room where the length of the wall is 3 ft. more than its width. The wall has an area of  $130 \text{ ft}^2$ . What are the length and the width, in feet?

$$\begin{aligned}(w + 3)(w) &= 130 \\w^2 + 3w - 130 &= 0 \\(w + 13)(w - 10) &= 0 \\w &= 10 \text{ or } -13\end{aligned}$$

*However, since the measure must be positive, the width is 10 ft., and the length is 13 ft.*

3. Find two consecutive even integers whose product is 80. (There are two pairs, and only an algebraic solution will be accepted.)

$$\begin{aligned}(w)(w + 2) &= 80 \\w^2 + 2w - 80 &= 0 \\(w + 10)(w - 8) &= 0 \\w &= 8 \text{ or } -10\end{aligned}$$

*So, the consecutive even integers are 8 and 10 or  $-10$  and  $-8$ .*

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