

1.

$$\begin{aligned}n(2n^2 + 11n + 5) \\ n(2n + 1)(n + 5)\end{aligned}$$

2.

cannot be factored

3.

$$\begin{aligned}\frac{1}{3}(4x^2 - 20x + 25) \\ \frac{1}{3}(2x - 5)^2\end{aligned}$$

4.

$$\begin{aligned}(2x^3 - 3x^2) + (-18xy^2 + 27y^2) \\ x^2(2x - 2) - 9y^2(2x + 3) \\ (x^2 - 9y^2)(2x - 3) \\ (x + 3y)(x - 3y)(2x - 3)\end{aligned}$$

5.

- a) $5x(2x^2 + 17x + 8)$
 $5x(2x + 1)(x + 8)$
The side lengths are $5x$ feet, $2x + 1$ feet, and $x + 8$ feet long.
- b) $5(7) = 35$ ft
 $2(7) + 1 = 15$ ft
 $(7) + 8 = 15$ ft
The longest side is 35 feet.

6.

$$\begin{aligned}(x + 4)(x - 1) = 0 \\ x + 4 = 0, x - 1 = 0 \\ x = -4, 1\end{aligned}$$

7.

$$\begin{aligned}x(x - 12) = 0 \\ x = 0, x - 12 = 0 \\ x = 0, 12\end{aligned}$$

8.

$$\begin{aligned}(2x - 5)(x - 1) = 0 \\ 2x - 5 = 0, x - 1 = 0 \\ x = \frac{5}{2}, 1\end{aligned}$$

9.

$$\begin{aligned}-5(x^2 - 12x + 36) = 0 \\ -5(x - 6)(x - 6) = 0 \\ x - 6 = 0, x - 6 = 0 \\ x = 6\end{aligned}$$

10.

The Zero-Product Property says that when the product of an equation is equal to zero, one of the factors must be zero (If $ab = 0$, then $a = 0$, $b = 0$, or $a = b = 0$).

This is important because it allows the values of each factored expression to be found by setting each factor equal to zero.