

# 4-3 Solving Quadratic Equations by Factoring

I can... find zeros/roots/solutions of a quadratic by factoring.

## Day 2 $a > 1$

Writing Quadratic Equations given Roots

In Standard Form

$$\begin{array}{l}
 \text{4, 6} \quad \begin{array}{l} x=4 \\ x-4=0 \end{array} \quad \begin{array}{l} x=6 \\ x-6=0 \end{array} \\
 (x-4)(x-6)=0 \\
 x(x-6)-4(x-6)=0 \\
 x^2-6x-4x+24=0 \\
 x^2-10x+24=0
 \end{array}$$

1. Write a quadratic equation in standard form with  $\frac{1}{2}$  and  $-5$  as its roots.

$$x = \frac{1}{2} \quad x = -5$$

$$x - \frac{1}{2} = 0 \quad (x + 5) = 0$$

$$(2x - 1) = 0$$

$$(2x - 1)(x + 5) = 0$$

$$2x(x + 5) - 1(x + 5) = 0$$

$$2x^2 + 10x - x - 5 = 0$$

$$2x^2 + 9x - 5 = 0$$

2. Write a quadratic equation with  $-\frac{3}{4}$  and  $5$  as its roots.

$$4x = -\frac{3}{4} \quad x = 5$$

$$4x = -3 \quad -5 - 5$$

$$+3 \quad +3$$

$$4x + 3 = 0 \quad x - 5 = 0$$

$$(4x + 3)(x - 5) = 0$$

$$4x(x - 5) + 3(x - 5)$$

$$4x^2 - 20x + 3x - 15$$

## Greatest Common Factor

3. Solve  $9y^2 + 3y = 0$

$y = 0, -\frac{1}{3}$

$3y(3y+1) = 0$

$\frac{3y}{3} = \frac{0}{3}$

$y = 0$

$3y + 1 = 0$

$\frac{3y}{3} = \frac{-1}{3}$

$y = -\frac{1}{3}$

4. Solve  $5a^2 - 20a = 0$

$5a(a - 4) = 0$

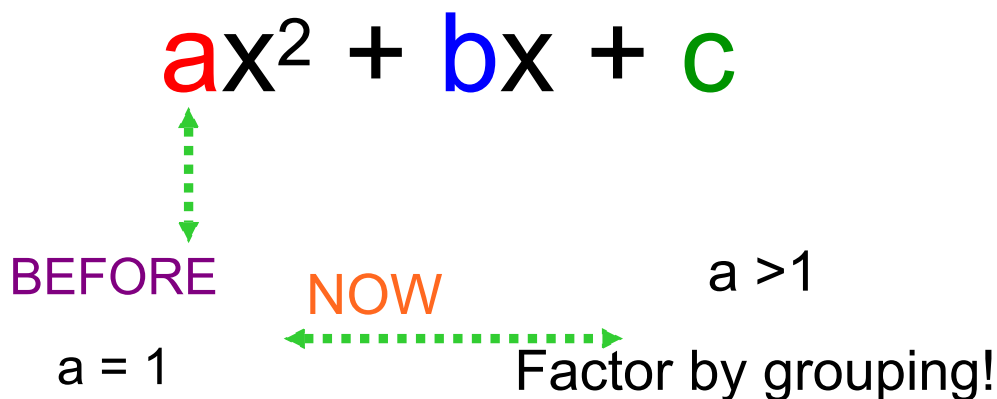
$5a = 0$

$a = 0$

$a - 4 = 0$

$a = 4$

# Standard form of a Quadratic



Factor by grouping.

$$5x^2 + 27x + 10$$

$(5x^2 + 25x) + (2x + 10)$   
 $5x(x + 5) + 2(x + 5)$   
 $(x + 5)(5x + 2)$

$\begin{array}{r|l} 50 & 27 \\ \hline 2 \cdot 25 & 2 + 25 \end{array}$

5.  $4x^2 + 24x + 32$

$$4 \cdot 32 = \quad | \quad 24$$

6.  $3x^2 + 26x + 35 = 0$

$$x = -7$$

$$x = -\frac{5}{3}$$