8-3

Solving Quadratics

Objective: I can solve quadratic equations by factoring and using the zero-product property.

I can write a quadratic equation given the zeros or x-intercepts

Vocabulary: Zeros/Roots, X-Intercepts, Zero-Product Propery, Solve,

What does it mean to "solve" an equation?

$x = 5$

The Zero-Product Property

$$(?)(??)=0$$

The Zero-Product Property

If ab = 0, then a = 0 or b = 0 or both a and b are 0

Solve

$(x + 5)(2x - 3) = 0$

$x + 5 = 0$

$-5 \quad -5$

$x = -5$

Solve

$x(x + 9) = 0$

$x = 0$

$x + 9 = 0$

$-9 \quad -9$

$x = -9$

Your turn! Solve

$(x - 1)(4x + 7) = 0$

$x - 1 = 0$

$+1 \quad +1$

$x = 1$

$4x + 7 = 0$

$-7 \quad -7$

$\frac{4x}{4} = \frac{-7}{4}$

$x = -7/4$

Solve by factoring

★

$x^2 + 5x + 4 = 0$

$(x+4)(x+1)=0$

$x+4=0 \quad x+1=0$

$x = -4, -1$

$2x^2 + 12x = -18$

$+18 \quad +18$

$2x^2+12x+18=0$

Solve by factoring

$x^2 + 10x + 15 = -6$

$x^2 - 5x + 4 = 4$

The length of a rectangle is 8 feet more than its width. If the area of the rectangle is 84 square feet, what are the dimensions of the rectangle?

Try to solve by factoring...

$$x^2 - 2x - 24 = 0$$

What now?!

Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$ax^2 + bx + c$$

Solve using the quadratic formula

$3a^2 - 6a - 34 = 0$

a b c

$$\frac{6 \pm \sqrt{(-6)^2 - 4(3)(-34)}}{2(3)}$$

$4n^2 + 11n = 15$

$$\frac{6 \pm \sqrt{36 + 408}}{6}$$

$x = 9.5, 2.5$