

Solving Quadratic Equations ($ax^2 + bx + c = 0$)

★ Method #1: Factoring

$$\text{Example 1: } x^2 + 6x + 8 = 0$$

Add Multiply



$$(x + 2)(x + 4) = 0$$

Either $x + 2 = 0$ or $x + 4 = 0$

$$x = -2 \qquad x = -4$$

"Simple Trinomial"

The roots of this quadratic equation are -2 and -4.

★ 2 x-intercepts!

1-4, 1-14

Example 2: $7x^2 + 4x = 0$

"Common Factor"

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

Either $x = 0$ or $7x + 4 = 0$

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

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

The roots of this quadratic equation are 0 and $\frac{-4}{7}$.

★ 2 x-intercepts!

Example 3: $10x^2 = 100$

"Simple Solving"

*Since there is only 1 variable we can solve for "x" very easily.

$$\frac{10x^2}{10} = \frac{100}{10}$$

$$x^2 = 10$$

$$x = \sqrt{10}$$

$$x = +\sqrt{10} \text{ and } -\sqrt{10}$$

$$x = \pm \sqrt{10}$$

The roots of this quadratic equation are $+\sqrt{10}$ and $-\sqrt{10}$.

★ 2 x-intercepts!

Example 4: $2x^2 + x - 15 = 0$

$$2x^2 + 6x - 5x - 15 = 0$$

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

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

Either $x + 3 = 0$ or $2x - 5 = 0$

$$x + 3 = 0 \quad 2x - 5 = 0$$

$$x = -3 \quad \underline{2x} = \underline{5}$$

$$2 \quad 2$$

$$x = \underline{\underline{\frac{5}{2}}}$$

$$2$$

"Decomposition"

Multiply $\Rightarrow -30$ Add $\Rightarrow 1$

★ + 6 and -5

The roots of this quadratic equation are -3 and $\frac{5}{2}$.

★ 2 x-intercepts!

$$2xy - 5y$$

$$y(2x - 5)$$

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

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

$$x+3=0 \quad | \quad 2x-5=0$$

$$x=-3 \quad | \quad 2x=5$$

$$x=5/2$$