Quadratic Formula

* Set the equation equal to zero *

$$ax^2 + bx + c = 0$$

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

* Identify the values for a, b, & c *

Examples Find a, b, & c

① $2x^2 + 4x - 3 = 0$

$a = 2$

$b = 4$

$c = -3$

② $x^2 - 5x + 8 - 2 = 2 - 2$

$1x^2 - 5x + 6 = 0$

$a = 1$

$b = -5$

$c = 6$

Solve using Quadratic Formula

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

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

(*) $x^2 + 8x + 15 = 0$

$a = 1$

$b = 8$

$c = 15$

replace a, b, c with ( ).

$$x = \frac{-(8) \pm \sqrt{(8)^2-4(1)(15)}}{2(1)}$$

$$x = \frac{-8 \pm \sqrt{64-60}}{2}$$

$$x = \frac{-8 \pm \sqrt{4}}{2}$$

$$x = \frac{-8 \pm 2}{2}$$

Simplify

$$x = \frac{-8+2}{2} = \frac{-6}{2} = -3$$

$$x = \frac{-8-2}{2} = \frac{-10}{2} = -5$$

$x = -3$ or $x = -5$

Ex: Solve $2x^2 - 3x - 4 = 0$

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

$a = 2$

$b = -3$

$c = -4$

$$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(2)(-4)}}{2(2)}$$

$$x = \frac{3 \pm \sqrt{9 + 32}}{4}$$

Answer:

$$x = \frac{3 \pm \sqrt{41}}{4}$$