

Quadratic Equations

Quadratic Formula

If a, b, & c are real numbers and $a \neq 0$, the quadratic equation, $ax^2 + bx + c = 0$, has

solutions: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. I recommend using the Quadratic Formula whenever it is not easy to see factoring and you are not required to use any other method.

If no other method is easy to use, the Quadratic Formula will always work.

Examples:

➤ $2x^2 + 3x - 2 = 0 \rightarrow a = 2, b = 3, c = -2 \rightarrow$

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

$$x = \frac{-3 \pm \sqrt{9 + 16}}{4} \rightarrow x = \frac{-3 \pm \sqrt{25}}{4} \rightarrow$$

$$x = \frac{-3 \pm 5}{4} \rightarrow x = \frac{2}{4} \text{ \& } x = \frac{-8}{4} \rightarrow$$

$$x = \frac{1}{2} \text{ \& } x = -2$$

➤ $x^2 + 4 = 6x \rightarrow x^2 - 6x + 4 = 0 \rightarrow a = 1, b = -6, c = 4 \rightarrow$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \rightarrow x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(4)}}{2(1)} \rightarrow$$

$$x = \frac{6 \pm \sqrt{36 - 16}}{2} \rightarrow x = \frac{6 \pm \sqrt{20}}{2} \rightarrow$$

$$x = \frac{6 \pm 2\sqrt{5}}{2} \rightarrow x = \frac{6}{2} \pm \frac{2\sqrt{5}}{2} \rightarrow$$

$$x = 3 \pm \sqrt{5}$$

NOTE: make sure you cancel factors not terms or part of terms!