

Name: _____

Date: _____

Solving Quadratic Equations Using the Quadratic Formula

The Quadratic Formula

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

Solve each equation.

1. $x^2 + 9x + 14 = 0$

$a = 1$

$b = 9$

$c = 14$

$$x = \frac{-9 \pm \sqrt{(9)^2 - 4(1)(14)}}{2}$$

$$x = \frac{-9 \pm \sqrt{25}}{2}$$

$$x = \frac{-9 \pm 5}{2} \begin{cases} \rightarrow \frac{-9+5}{2} \rightarrow \boxed{x = -2} \\ \rightarrow \frac{-9-5}{2} \rightarrow \boxed{x = -7} \end{cases}$$

Solve each equation using the quadratic formula.

2. $x^2 - 4x + 3 = 0$

$a = 1$

$b = -4$

$c = 3$

$$x = \frac{4 \pm \sqrt{(-4)^2 - 4(1)(3)}}{2}$$

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

$$x = \frac{4 \pm 2}{2} \begin{cases} \rightarrow \frac{4+2}{2} \rightarrow \boxed{x = 3} \\ \rightarrow \frac{4-2}{2} \rightarrow \boxed{x = 1} \end{cases}$$

3. $x^2 + 10x + 2 = 0$

$a = 1$

$b = 10$

$c = 2$

$$x = \frac{-10 \pm \sqrt{(10)^2 - 4(1)(2)}}{2}$$

$$x = \frac{-10 \pm \sqrt{92}}{2}$$

$$x = \frac{-10 \pm 2\sqrt{23}}{2}$$

$$x = -5 \pm \sqrt{23}$$

$$\boxed{x = -5 + \sqrt{23}}$$

$$\boxed{x = -5 - \sqrt{23}}$$

4. $x^2 + 3x - 7 = 0$

$a = 1$

$b = 3$

$c = -7$

$$x = \frac{-3 \pm \sqrt{(3)^2 - 4(1)(-7)}}{2}$$

$$x = \frac{-3 \pm \sqrt{37}}{2}$$

$$x = \frac{-3 + \sqrt{37}}{2}$$

$$x = \frac{-3 - \sqrt{37}}{2}$$

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

$a = 2$

$b = -1$

$c = 2$

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

$$\frac{1 \pm \sqrt{-15}}{4} \Rightarrow \text{no real solutions}$$

6. $3x^2 - x + 8 = 0$