Names: _____ _____ _____

Activity #2: Quadratic Equations (Solutions) **College Algebra**

1. Find all solutions of the following equation.

$$x^2 - 2x - 15 = 0$$

Solution: We can solve this equation by factoring. We have

$$x^2 - 2x - 15 = (x + 3)(x - 5) = 0,$$

which is true if $\boxed{x = -3 \text{ or } x = 5}$.

2. Find all solutions of the following equation.

$$x^2 + 3x - 28 = 0$$

Solution: We can solve this equation by factoring. We have

$$x^2 + 3x - 28 = (x + 7)(x - 4) = 0,$$

which is true if $\boxed{x = -7 \text{ or } x = 4}$.

3. Find all solutions of the following equation.

$$2x^2 - 15x + 25 = 0$$

Solution: We can solve this equation by factoring. We have

$$2x^2 - 15x + 25 = (2x - 5)(x - 5) = 0,$$

which is true if $\boxed{x = 5/2 \text{ or } x = 5}$. (We can also use the quadratic formula.)

4. Find all solutions of the following equation.

$$3x^2 - x - 10 = 0$$

Solution: We can solve this equation by factoring. We have

$$3x^2 - x - 10 = (3x + 5)(x - 2) = 0,$$

which is true if $\boxed{x = -5/3 \text{ or } x = 2}$. (We can also use the quadratic formula.)

5. Find all solutions of the following equation.

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

Solution: We can try factoring this equation, but there are no two integers whose sum is 2 and whose product is -2. Instead we will use the quadratic formula as follows.

$$\begin{aligned} x &= \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \\ &= \frac{-2 \pm \sqrt{(2)^2 - 4(1)(-2)}}{2} \\ &= \frac{-2 \pm \sqrt{12}}{2} \\ &= \frac{-2 \pm 2\sqrt{3}}{2} \\ &= -1 \pm 1\sqrt{3} \end{aligned}$$

Thus $\boxed{x = -1 \pm 1\sqrt{3}}$.