SOLVING QUADRATIC EQUATIONS

Note: Solving quadratic equations is NOT done the same way solving linear equations is done.

Steps for solving quadratic equations:

Step 1: Set the equation equal to zero

Step 2: Factor the polynomial completely

Step 3: Set each factor equal to zero

Step 4: Solve

Example 1: Solve for x if

\[ x^2 - x - 6 = 0 \]

Step 1: The equation is already set equal to zero.

Step 2: Factor:

\[ x^2 - x - 6 = 0 \]

\[ (x - 3)(x + 2) = 0 \]

Step 3: \[ x - 3 = 0 \quad \text{and} \quad x + 2 = 0 \]

\[ +3 \quad +3 \quad -2 \quad -2 \]

Step 4: \[ x = 3 \quad x = -2 \]
Example 2: Solve for $x$ if

$$x(x-5) = -4$$

Step 1: $x(x-5) = -4$

\[+4\quad +4\]

$$x(x-5) + 4 = 0$$

We need to distribute the $x$ in order to factor the trinomial

$$x^2 - 5x + 4 = 0$$

Step 2:

Step 3:

Step 4:
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**Solve for x:**

1. \( x^2 + 3x + 2 = 0 \)

2. \( x^2 = 4 + 3x \)

3. \( 2(x^2 - 4x) = -12x \)