

MAT 0024 5.7 Solving Polynomial Equations by Factoring

A quadratic or second degree equation (highest power of x is 2) is one that may be written in the form $ax^2 + bx + c = 0$, where $a \neq 0$.

Examples: $x^2 - 2x + 4 = 0$, $x^2 - 5x = 8$, $5x^2 = 3x$, $x^2 = 25$

We use the **Principle of Zero Products** to solve a quadratic equation:

$AB = 0$ is true if and only if $A = 0$ or $B = 0$ or both.

(A product is 0 if and only if at least one factor is 0.)

Use the **Principle of Zero Products** to solve these equations:

1. $x(x + 3) = 0$

2. $(x - 4)(3x + 1) = 0$

3. $x(x + 1)(5x - 2) = 0$

To Solve a Quadratic Equation:

- 1) Get 0 on one side of the equation. **Make term of highest degree positive.** Write in descending order! (If $(\quad)(\quad) = \underline{\text{nonzero}}$ number, FOIL parentheses first.)
- 2) Factor the other side of the equation.
- 3) Set each factor equal to 0 and solve for the variable. Check!

SOLVE:

1. $x^2 - 25 = 0$

2. $x^2 - x - 12 = 0$

3. $x^3 + 14x^2 + 24x = 0$

4. $y^2 - 9y = 0$

5. $w^2 - 16 = 0$

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