

# Solving Quadratic Equations by Factoring

## Section 6.5

### Task 1

When you are asked to solve an equation you automatically think to ISOLATE the variable. Right?

**For example:**

Solve the equation and explain each step.

$$2(x - 3) = 3x - 5$$

The equation above is a LINEAR EQUATION. Why? \_\_\_\_\_

So you are using properties that I know you are familiar with.

- Distributive Property — this is used to \_\_\_\_\_
- Addition Property of Equality - This is used to \_\_\_\_\_
- Subtraction Property of Equality - \_\_\_\_\_
- Multiplication Property of Equality - \_\_\_\_\_
- Division Property of Equality - \_\_\_\_\_

### Task 2

Now, we will be solving quadratic equations.

What is a quadratic equation? \_\_\_\_\_

**Example of a quadratic equation:**

$$x^2 - 5x = 24$$

**Definition:** A quadratic equation is an equation that can be written in the form of

$$ax^2 + bx + c = 0$$

So can you solve a quadratic equation using the properties I've listed ABOVE? Why or Why Not?

The ZERO PROPERTY, is here to help you solve quadratic equations.

**Zero Property:** If  $AB = 0$ , then  $A = 0$  and  $B = 0$

In our own words ... what does this mean?

**Example 1**

Solve the equation  $(x - 6)(x - 7) = 0$  and please describe each step.

**Example 2**

Solve the equation  $x^2 - 5x = 24$  and please describe each step.

**Example 3**

Solve the equation  $x^2 + 20x = 0$  and please describe each step.

**Example 4**

Solve the equation  $x^2 = 9$  and please describe each step.

**Example 5**

Solve the equation  $x(4x - 11) = 3$  and please describe each step.

**Example 6**

Solve the equation  $3x^3 - 27x = 0$  and please describe each step.

**Example 7**

Solve the equation  $x^2 + 22x + 121 = 0$  and please describe each step.

## Word problems for practice.

### Problem 1

The width of a rectangle is 7ft less than its length and its area is  $120\text{ft}^2$ . Find the length and the width of the rectangle.

### Problem 2

The perimeter of a rectangle is 46 ft. The length of the rectangle is 5 ft less than three times the width. Find the length of the rectangle.

### Problem 3

The sum of a number and its square is 182. Find the number.

### Problem 4

The product of two consecutive integers is 420. Find the numbers.