ALGEBRA 4
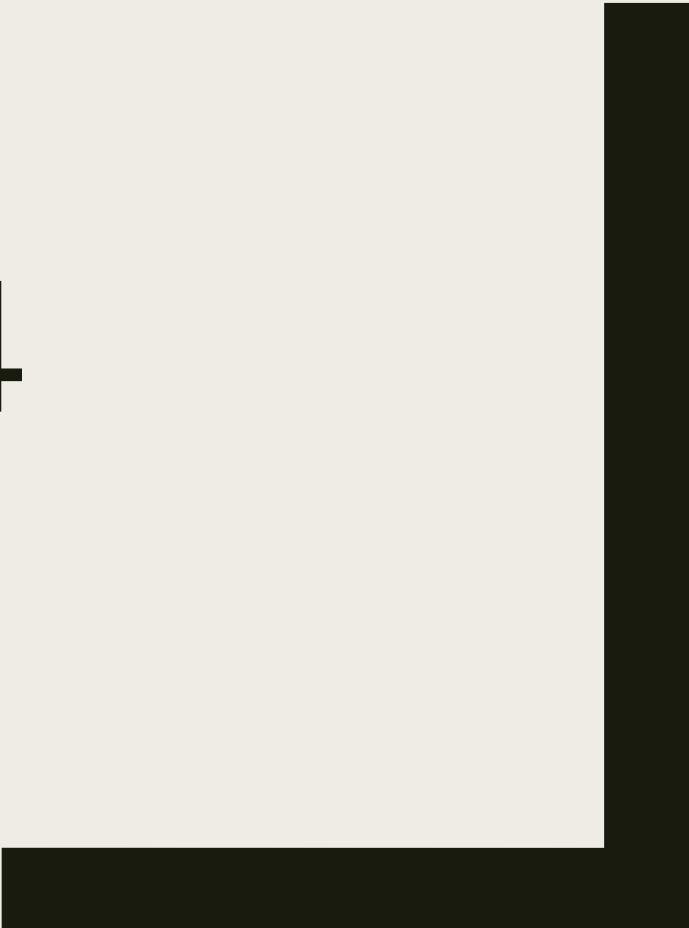
Day 43

From Last Time

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Bell Work

Solve

1.) $0 = -4x + 12$

2.) $x^2 - x = 20$

Objective

- Solve quadratics with real and imaginary solutions

Quadratic Review

■ Multiple ways to solve quadratic, $ax^2 + bx + c$, equations

– *Factoring* *(best when a = 1)*

– *Graphing* *(set = 0 and find roots)*

– *Quadratic Formula*

The Quadratic Formula;

The solutions of the quadratic equation
ax^2 + bx + c = 0 are:

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

-- Can be used to solve any quadratic equation (instead of factoring or graphing)

--Must be in standard form; ax^2 + bx + c = 0

Solve:

1.) $5x^2 = 20$

2.) $x^2 + x = 6$

3.) $3x^2 - 17x + 10 = 0$

4.) $x^2 = -9$

Imaginary Unit: i, defined as $i = \sqrt{-1}$ or, $\mathbf{i^2 = -1}$

Examples: <u>Simplify using imaginary, i</u>

Example 1:
$$\sqrt{-31} = \pm i\sqrt{31}$$

Example 2:
$$\sqrt{-25} = \pm 5i$$

Example 3:
$$\sqrt{-18} = i3\sqrt{2} = \pm 3i\sqrt{2}$$

Solving Quadratics Equations with Complex Solutions

If there is no "b" value

1) Isolate the squared term on one side of the equation

2) Square root both sides

3) Substitute i = √-1 into equation and simplify radical

4) Write solution in Standard Form (a + bi)

If there is or is not a "b" value

1.) Use Quadratic Formula

Examples:

1.) $x^2 = -9$

2.) $2x^2 + 3x = -13$

3.) $4x^2 + 6 = 5x$

For Next Time

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Unit 5 Quiz 1: Level 2

Solve the following:

1.) $4x^2 - 36 = 0$

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

Unit 5 Quiz 1: Level 3 & 4

Solve the following (L3)

3.) $x^2 + 14x = 4x - 16$

4.) $x^2 = -25$

Solve the following (L4)

5.) $x(x^2 - 16) = 0$