Name _____ Date _____

Solving Quadratic Equations - Guided Lesson Explanation

The quadratic equation is stated as:

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

Explanation #1

Solving by factoring:

$x^2 + 5x - 20 = 16$

$x^2 + 5x - 36$ (Combine Like Terms)

$(x + 9)(x - 4)$ (Factor)

$x + 9 = 0$ $x - 4 = 0$ (solve for x)

$x = -9$ $x = 4$

Solving by using the quadratic equation:

Step 1) Place the numbers into the formula:

$$x = \frac{-5 \pm \sqrt{5^2 - 4 \times 1 \times (-36)}}{2 \times 1}$$

$$x = \frac{-5 \pm \sqrt{169}}{2}$$

Step 2) Calculate.

Step 3) Finalize by calculating both the plus and minus version.

$$x_1 = \frac{-5 + \sqrt{169}}{2} = 4$$

$$x_2 = \frac{-5 - \sqrt{169}}{2} = -9$$

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Explanation #2

$x^2 - 6x - 18 = 9$

$x^2 - 6x - 27$ (Combine Like Terms)

$(x + 9)(x - 3)$ (Factor)

$x + 9 = 0$ $x - 3 = 0$ (Solve for x)

$x = -9$ $x = 3$

Solving by using the quadratic equation:

Step 1) Place the numbers into the formula:

$$x = \frac{-6 \pm \sqrt{6^2 - 4 \times 1 \times (-27)}}{2 \times 1}$$

Step 2) Perform all the operations.

$$x = \frac{-6 \pm \sqrt{144}}{2}$$

Step 3) Finalize by calculating both the plus and minus version.

$$x_1 = \frac{-6 + \sqrt{144}}{2} = 3$$

$$x_2 = \frac{-6 - \sqrt{144}}{2} = -9$$

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Explanation #3

$x^2 + 4x - 32$ (No like terms to combine.)

$(x + 8)(x - 4)$ (Factor)

$x + 8 = 0$ $x - 4 = 0$ (Solve for x)

$x = -8$ $x = 4$

Solving by using the quadratic equation:

Step 1) Place the numbers into the formula:

$$x=\frac{-4\pm\sqrt{4^2-4\times1\times(-32)}}{2\times1}$$

Step 2) Perform all the operations.

$$x=\frac{-4\pm\sqrt{144}}{2}$$

Step 3) Finalize by calculating with both plus and minus version.

$$x_1=\frac{-4+\sqrt{144}}{2}=4$$

$$x_2=\frac{-4-\sqrt{144}}{2}=-8$$