Study Guide

Quadratic Formula
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Quadratic Formula

A quadratic equation is a polynomial equation in which the highest power of the unknown variable is two.

An example of a quadratic equation is below.

$$x^2 + 6x - 91 = 0.$$

The format of a quadratic equation is $ax^2 + bx + c = 0$. Quadratic equations can be solved by factoring, graphing, or by using the quadratic formula. The quadratic formula is as follows:

Quadratic Formula

It can be found in any algebra textbook. This formula should be memorized.

To apply the formula to a quadratic equation, use the quadratic equation format given above as a guideline.

Example 1: Solve the quadratic equation.

$$x^2 + 6x - 91 = 0$$

(1) $\qquad$ (2) $\qquad$ (3)

$$x = \frac{-6 \pm \sqrt{6^2 - 4(1)(-91)}}{2(1)} \qquad x = \frac{-6 \pm \sqrt{400}}{2} \qquad x = \frac{-6 \pm 20}{2}$$

(4)

$$x = \frac{-6 + 20}{2} \text{ and } x = \frac{-6 - 20}{2}$$

$$x = \frac{14}{2} \qquad\qquad x = \frac{-26}{2}$$

$$x = 7 \text{ and } x = -13$$

Step 1: Determine the values of a, b, and c and substitute them into the quadratic formula. a = 1, b = 6, and c = -91

Step 2: Determine the value under the radical symbol. 6 squared is 36 and -91 times -4 equals 364. 36 + 364 = 400

Step 3: The square root of 400 is 20 (20 x 20 = 400).

Step 4: Split the remaining problem into two problems: (-6 + 20) ÷ 2 and (-6 - 20) ÷ 2 and solve the two problems.

The answers are x = 7 and x = -13.

Example 2: Solve the quadratic equation.

$$5x^2 + 2x + 8 = 4x^2 - 2x + 4$$