

DISTANCE LEARNING – ASSIGNMENT #4

This packet is a review of the quadratic formula. It is very important that you attend class on Tuesday and/or Thursday to help you understand the material, as well as give you the chance to ask any questions.

PART ONE – WHAT IS THE QUADRATIC FORMULA?

- The quadratic formula is an equation used to find solutions to quadratic equations when factoring won't work.
- Before using the quadratic formula, you must identify the values of all coefficients and the constant in the quadratic equation.
- In addition, the equation must be set equal to zero AND written in standard form before you can identify the necessary numbers for the quadratic formula.
- **SPECIAL NOTE:** The quadratic formula will work to solve ANY quadratic equation.

EXAMPLE 1:

Solve the equation using the quadratic formula.

$$x^2 - 5x - 14 = 0$$

FIRST: Let's remind ourselves what the quadratic formula looks like, and how to identify the variables involved in the formula.

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

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

a is the number in front of x^2

b is the number in front of x

c is the number without a variable (the constant)

SECOND: Let's make sure that the equation we are given is set equal to zero and in standard form. Since it is, we can list the values of each variable, according to your given equation

$$a = 1$$

$$b = -5$$

$$c = -14$$

THIRD: We can now plug these numbers into the quadratic formula.

$$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(1)(-14)}}{2(1)}$$

FOURTH: Now, it is just a matter of simplifying the equation until you get down to your solution(s).

$$x = \frac{5 \pm \sqrt{25 + 56}}{2}$$

$$x = \frac{5 \pm \sqrt{81}}{2}$$

$$x = \frac{5 \pm 9}{2}$$

$$x = \frac{5+9}{2} \text{ AND } x = \frac{5-9}{2}$$

$$x = 14/2 = 7 \text{ AND } x = -4/2 = -2$$

ANSWERS: $x = 7, -2$

EXAMPLE 2:

Solve the equation using the quadratic formula.

$$2x^2 = 3x + 5$$

FIRST: Let's remind ourselves what the quadratic formula looks like, and how to identify the variables involved in the formula.

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

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

a is the number in front of x^2

b is the number in front of x

c is the number without a variable (the constant)

SECOND: Let's make sure that the equation we are given is set equal to zero and in standard form. Since it is NOT, we must rearrange the equation and then identify our three values.

$$2x^2 - 3x - 5 = 0$$

$$a = 2$$

$$b = -3$$

$$c = -5$$

THIRD: We can now plug these numbers into the quadratic formula.

$$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(2)(-5)}}{2(2)}$$

FOURTH: Now, it is just a matter of simplifying the equation until you get down to your solution(s).

$$x = \frac{3 \pm \sqrt{9 + 40}}{4}$$

$$x = \frac{3 \pm \sqrt{49}}{4}$$

$$x = \frac{3 \pm 7}{4}$$

$$x = \frac{3+7}{4} \text{ AND } x = \frac{3-7}{4}$$

$$x = 10/4 = 5/2 \text{ AND } x = -4/4 = -1$$

ANSWERS: $x = 5/2, -1$

ASSIGNMENT: Solve quadratic equation using the quadratic formula.

1. $x^2 - 4x + 4 = 0$

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

3. $4x^2 + 8x + 7 = 4$

4. $2x^2 - 7x - 13 = -10$