Day 5: Quadratic Formula

Date_____

1) When our quadratic equations will not factor, there is a method we can use to solve quadratic equations, called the Quadratic Formula.

****You need to memorize this equation!****

The quadratic formula is:

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

x-int

$\left(-\frac{1}{2}, 0\right)$

$(\sqrt{5}, 0)$

$(1+2\sqrt{7}, 0)$

$\left(\frac{3-2i\sqrt{6}}{5}, 0\right)$

Standard Form $y = Ax^2 + Bx + C$

2) The values of A, B, and C come from having the quadratic equation in Standard Form, where A and B are the Coefficients. and C is the Constant (y-intercept).

*Note: in order for the quadratic formula to work the equation must be set equal to _____.

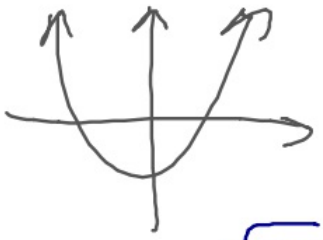
3) Is this equation able to be factored?

$y = x^2 + 4x - 9$

$(x+\ )(x-\ )$ $\quad 9 \quad 1\cdot 9 \quad 3\cdot 3$

Since the answer was no, we will use the quadratic formula to find the x-intercepts. First, we must identify the following:

$A =$ 1 $\quad B =$ 4 $\quad C =$ −9



Now plug in the values of A, B, and C to the quadratic formula:

$$\frac{-4 \pm \sqrt{4^2-4(1)(-9)}}{2(1)}$$

Next, we want to solve for x by reducing our quadratic formula:

$$\frac{-4 \pm \sqrt{16+36}}{2}$$

$$\frac{-4 \pm \sqrt{52}}{2}$$

$$\frac{-4 \pm 2\sqrt{13}}{2} = -2 \pm \sqrt{13} \quad \begin{matrix} -2+\sqrt{13} \\ -2-\sqrt{13} \end{matrix}$$

$(-2+\sqrt{13}, 0)$ & $(-2-\sqrt{13}, 0)$

$\sqrt{52}$

$2 \cdot 26$

$2 \cdot 2 \cdot 13$

$2\sqrt{13}$

lkwiseman97@yahoo.com

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

Identify *a*, *b*, and *c*. Then find the *x*-intercepts using the quadratic formula.

4) $y = -2x^2 + 5x + 25$ a: -2 b: 5 c: 25

$\frac{-5 \pm \sqrt{5^2-4(-2)(25)}}{2(-2)}$: AOS $= \frac{-b}{2a}$

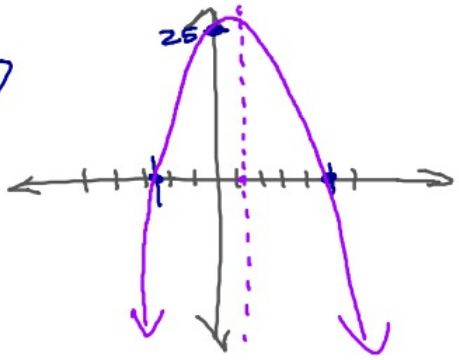
$\frac{-5 \pm \sqrt{25+200}}{-4}$

$\frac{-5 \pm \sqrt{225}}{-4}$

$\frac{-5 \pm 15}{-4}$ $\frac{-5+15}{-4} = \frac{10}{-4} = -\frac{5}{2}$ $\frac{-5-15}{-4} = \frac{-20}{-4} = 5$

$\left(-\frac{5}{2}, 0\right)$ & $(5, 0)$

5) $y = -x^2 + 5x + 40$



6) $y = 9x^2 + 6x + 4$ a: 9 b: 6 c: 4

$\frac{-6 \pm \sqrt{6^2-4(9)(4)}}{2(9)}$

$\frac{-6 \pm \sqrt{36-144}}{18}$

$\frac{-6 \pm \sqrt{-108}}{18}$

$\sqrt{-108}$

$\sqrt{-1 \cdot \sqrt{108}}$

i

$2 \cdot 54$

$2 \cdot 27$

$3 \cdot 3$

$3\sqrt{3}$

$2 \cdot 3 \cdot i \cdot \sqrt{3}$

$6i\sqrt{3}$

$\frac{-6}{18} \pm \frac{6i\sqrt{3}}{18}$

$-\frac{1}{3} \pm \frac{i\sqrt{3}}{3}$

$\frac{-6 \pm 6i\sqrt{3}}{6}$

$= \frac{-1 \pm i\sqrt{3}}{3}$

$\frac{-1+i\sqrt{3}}{3}$

$\frac{-1-i\sqrt{3}}{3}$

$\left(\frac{-1+i\sqrt{3}}{3}, 0\right)$ & $\left(\frac{-1-i\sqrt{3}}{3}, 0\right)$

7) $y = 3x^2 - 17$ $= 3x^2 + 0x - 17$

a: 3 b: 0 c: -17

8) $f(x) = 4x^2 + 5x + 1$

9) $f(x) = 2x^2 - 4x + 5$

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

10) $y = 2x^2 - 11x - 40$

11) $y = 3x^2 - 300$

12) $y = 5x^2 - 625$

13) $y = 6x^2 + 11x + 3$

14) $f(x) = 10x^2 + 11x + 5$

15) $f(x) = 12x^2 - 9x + 10$