Notes - Quadratic Formula - Day 1 Name: Key

Objective: SWBAT solve real life applications of quadratics using the quadratic formula.

Warm-Up

1. Factor: $2x^2 + 6x + 4$

$2x^2+2x+4x+4$

$2x(x+1)+4(x+1)$

$(2x+4)(x+1)$

Mult. 2·4 = 8; 2 and 4; Add 6

2. Find the vertex: $f(x) = 2x^2 + 6x - 4$

$2(x^2+3x+2.25)-4-4.5$

$2(x+1.5)-8.5$

Vertex: $(-1.5, -8.5)$

What is the standard form for a quadratic function? Ax^2+Bx+C

Quadratic Formula:

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

Find the zeros of the following quadratic equations using the Quadratic Formula.

1. $x^2 + 5x + 6 = 0$ (A B C)

$\frac{-5 \pm \sqrt{5^2-4(1)(6)}}{2(1)} = \frac{-5 \pm \sqrt{25-24}}{2}$

$= \frac{-5 \pm \sqrt{1}}{2} = \frac{-5 \pm 1}{2}$

$x = \frac{-5+1}{2} = -2$ $\quad x = \frac{-5-1}{2} = -3$

2. $x^2 - 4x + 12 = 0$ (A B C)

$\frac{-(-4) \pm \sqrt{(-4)^2-4(1)(12)}}{2(1)}$

$= \frac{4 \pm \sqrt{16-48}}{2} = \frac{4 \pm \sqrt{-32}}{2}$

No Real solutions (because negative √)

3. $-2x^2 + 7x - 1 = 0$

$\frac{-7 \pm \sqrt{7^2-4(-2)(-1)}}{2(-2)} = \frac{-7 \pm \sqrt{49-8}}{-4}$

$= \frac{-7 \pm \sqrt{41}}{-4} = \frac{7 \pm \sqrt{41}}{4}$

$x = \frac{7+\sqrt{41}}{4}$ $\quad x = \frac{7-\sqrt{41}}{4}$

4. $\frac{1}{2}x^2 - 2x - 4 = 0$

$\frac{-(-2) \pm \sqrt{(-2)^2-4(.5)(-4)}}{2(.5)} = \frac{2 \pm \sqrt{4+8}}{1}$

$= 2 \pm \sqrt{12}$

$x = 2+\sqrt{12}$ $\quad x = 2-\sqrt{12}$

5. $2x^2 - 6x - 3 = 5$ (−5 −5)

$2x^2-6x-8=0$

$\frac{-(-6) \pm \sqrt{(-6)^2-4(2)(-8)}}{2(2)} = \frac{6 \pm \sqrt{36+64}}{4}$

$= \frac{6 \pm \sqrt{100}}{4} = \frac{6 \pm 10}{4}$

$x = \frac{6+10}{4} = 4$

$x = \frac{6-10}{4} = -1$

6. $-\frac{1}{2}x^2 + 2x - 4 = -9$ (+9 +9)

$-\frac{1}{2}x^2+2x+5=0$

$\frac{-2 \pm \sqrt{2^2-4(-.5)(5)}}{2(-.5)} = \frac{-2 \pm \sqrt{4+10}}{-1}$

$= \frac{-2 \pm \sqrt{14}}{-1} = \frac{2 \pm \sqrt{14}}{1}$

$x = 2+\sqrt{14}$ $\quad x = 2-\sqrt{14}$