

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

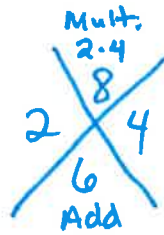
Warm-Up

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

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

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

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



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

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

$$2(x + 1.5) - 8.5$$

$$\text{Vertex: } (-1.5, -8.5)$$

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. $x^2 + 5x + 6 = 0$

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

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

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

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

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

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

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

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

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

5. $2x^2 - 6x - 8 = 0$

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

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

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

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

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

2. $x^2 - 4x + 12 = 0$

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

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

No Real solutions (because negative $\sqrt{\quad}$)

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

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

$$= 2 \pm \sqrt{12}$$

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

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

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

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

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

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

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

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