<u>Date:</u>

<u>Chapter:</u> Chapter 5:2 --> Solving Quadratic Equations by Graphing

<u>Objectives:</u> Solve and estimate solutions of quadratic equations by graphing.

Notes:

Arielle works in the marketing department of a major retailer. Her job is to set prices for new products sold in the stores. Arielle determined that for a certain product, the function $f(p) = -6p^2 + 192p - 1440$ tells the profit $f(p)$ made at price p.

Arielle can determine the price range by finding the prices for which the profit is equal to $0. This can be done by finding the solution of the related quadratic equation, which is zero. Graph the quadratic equation and state the range the profit is in.

*<u>**Quadratic Equation**</u> = Quadratic functions that are set = to a value.

*<u>**Standard Form**</u> --> $0 = ax^2 \pm bx \pm c$

*<u>**Roots**</u> = Solutions to a quadratic equation.
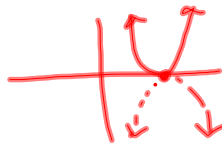
Function-Zeros   Eq- Roots

*<u>**Zeros**</u> = One method to finding the roots of a quadratic equation. They are the x-intercepts of the parabola.

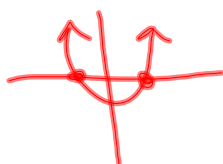---*Zeros and Roots are basically the same thing!*---

<u>**Three Types of Roots**</u>

1) One Solution (aka Double Root)
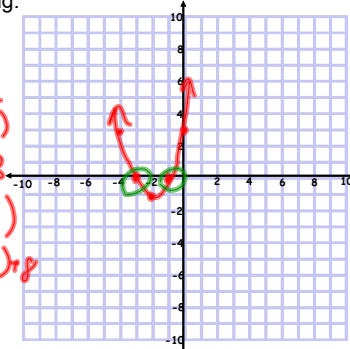

2) No Solution

3) Two Solutions

Examples:

Ex. 1 - Solve by graphing.

a) $x^2 + 6x + 8 = 0$

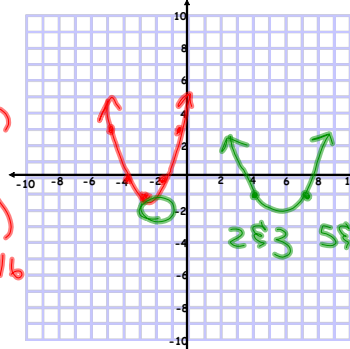| X	y
-1	3
-2	0
-3	-1
-4	0
-5	3

$X = \dfrac{-6}{2(1)}$

$X = -3$

$(-3, -1)$

$(-3)^2 + 6(-3) + 8$

$(-1)^2 + 6(-1) + 8 = \dfrac{-1}{3}$

$(-2)^2 + 6(-2) + 8 = 0$

b) $x^2 + 8x + 16 = 0$

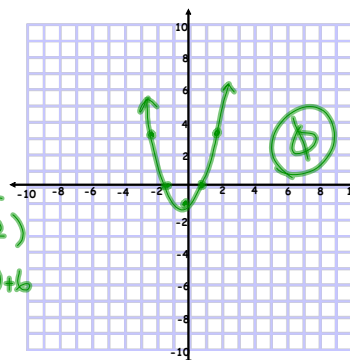| X	y
-2	4
-3	1
-4	0
-5	1
-6	4

$X = \dfrac{-8}{2(1)}$

$X = -4$

$(-4, 0)$

$(-4)^2 + 8(-4) + 16$

$(-2)^2 + 8(-2) + 16 = 4$

$(-3)^2 + 8(-3) + 16 = 1$

2 & 3   5 & 6

c) $x^2 + 4x + 6 = 0$

X	y
0	6
-1	3
-2	2
-3	3
-4	6

$X = \dfrac{-4}{2(1)}$

$X = -2$

$(-2, 2)$

$(-2)^2 + 4(-2) + 6$

$(-1)^2 + 4(-1) + 6 = \dfrac{2}{3}$

Ex. 2 - Estimate the solution(s).
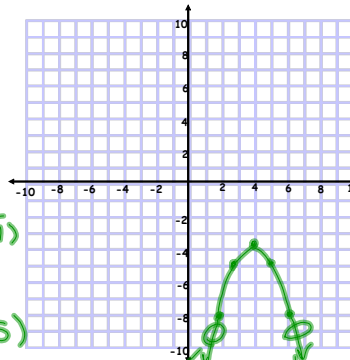
a) $x^2 - 6x + 4 = 0$

X	y
5	-1
4	-4
3	-5
2	-4
1	-1

$X = \dfrac{-(-6)}{2(1)}$

$X = 3$

$(3, -5)$

$2^2 - 6(2) + 4$ $3^2 - 6(3) + 4$

-4 -5

between 0 & 1

b) $-x^2 + 2x + 4 = 0$

$-6(1) + 4 = -7$

X	y
3	1
2	4
1	5
0	4
-1	1

$X = \dfrac{-2}{2(-1)}$
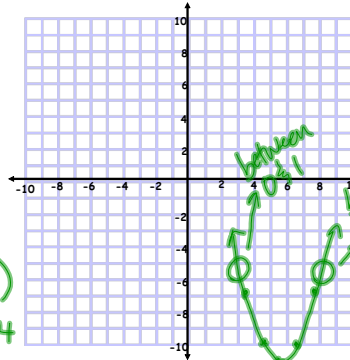
$X = 1$

$(1, 5)$

<u>Homework:</u>

p. 263 (#14-19, 20-32 Evens, 52, 57-60)