8.1-8.5 Review

Order each group of Quadratic Functions from WIDEST to NARROWEST

biggest → narrowest

smallest "widest"

$$f(x) = -\frac{1}{2}x^2;\ g(x) = 4x^2;\ h(x) = \frac{1}{4}x^2$$

h(x), f(x), g(x)

Convert to vertex from: $y = 2x^2 - 12x + 3$

a

Vertex Form: $y = a(x-h)^2 + k$

$x = \frac{-b}{2a}$ $y = ?$

$x = \frac{12}{2(2)} = 3 \leftarrow h$

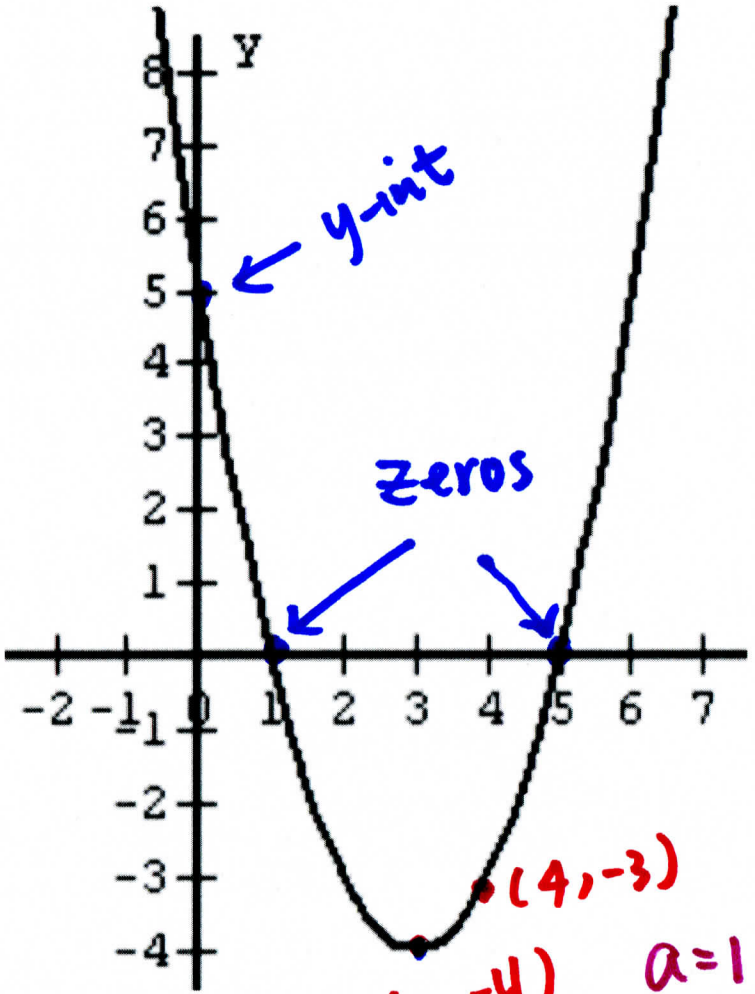
$y = 2(3)^2 - 12(3) + 3$

$= 18 - 36 + 3$

$= -18 + 3$

$= -15 \leftarrow k$

Answer: $y = 2(x-3)^2 - 15$



Slope of (3,-4) & (4,-3) a=1

Zeros: 1 & 5 or (1,0) & (5,0)

Vertex: (3,-4) A.O.S.: x=3

y-int: (0,5) Max/Min. -4

Domain: $\{x \mid x \in R\}$ Range: $\{y \mid y \geq -4\}$

Vertex Form Equation: $y = a(x-h)^2 + k$

$y = (x-3)^2 - 4$

Standard Form Equation:

$y = x^2 - 6x + 5$

$y = (x-3)(x-3) - 4$

$= x^2 - 3x - 3x + 9 - 4$

$= x^2 - 6x + 5$

Graph: $y = -\frac{1}{2}x^2 + 2x + 3$

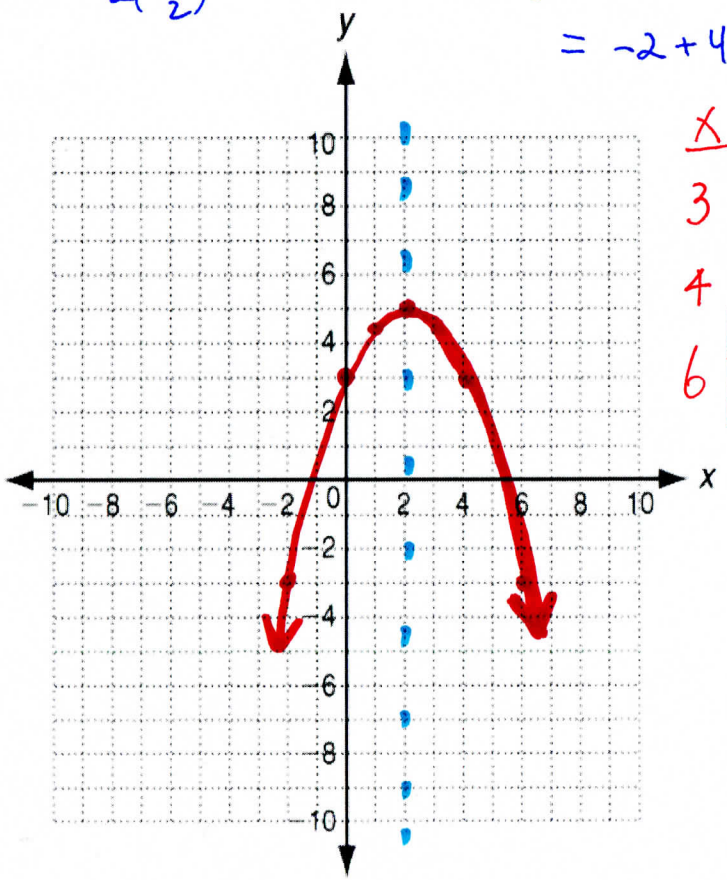
Vertex: (2, 5) A.O.S.: $x = 2$

y-int: (0, 3) Max/Min. 5

Domain: $\{x \mid x \in R\}$ Range: $\{y \mid y \leq 5\}$

$x = \frac{-2}{2(-\frac{1}{2})} = \frac{-2}{-1} = 2$; $y = -\frac{1}{2}(4) + 2(2) + 3$

$= -2 + 4 + 3 = 5$



x	y
3	$-\frac{1}{2}(9) + 6 + 3 = 4.5$
4	$-\frac{1}{2}(16) + 8 + 3 = 3$
6	$-\frac{1}{2}(36) + 12 + 3 = -3$

Graph: $y = 2(x-2)^2 - 3$

Vertex: (2, -3) A.O.S.: $x = 2$

y-int: (0, 5) Max/Min. -3

Domain: $\{x \mid x \in R\}$ Range: $\{y \mid y \geq -3\}$

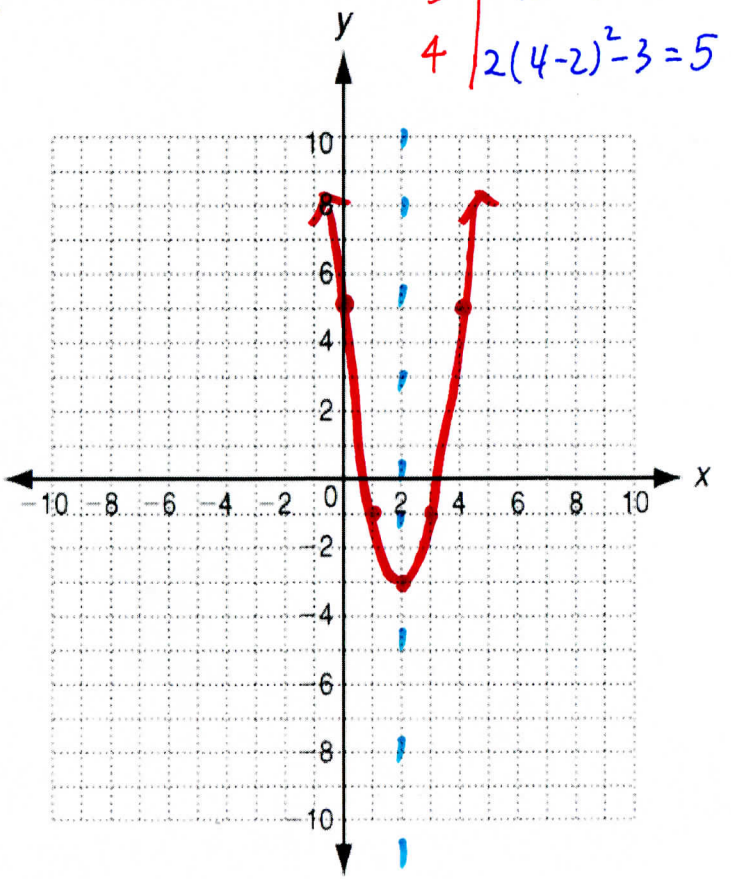
$y = 2(0-2)^2 - 3$

$= 2(4) - 3$

$= 8 - 3$

$= 5$ ← y-int

x	y
3	$2(3-2)^2 - 3 = -1$
4	$2(4-2)^2 - 3 = 5$



Compare $g(x) = -\frac{1}{3}x^2 + 3$ to $f(x) = x^2$ without graphing.

Width: g(x) is wider than f(x).

Up/Down: g(x) moves 3 units up.

Open: g(x) opens down ; f(x) opens up.

Vertex: g(x) vertex is (0, 3) ; f(x) vertex is (0, 0)

A.O.S: Same A.O.S. x = 0