Sept. 19, 2012 Section 3.6 / 8.5
CONT

① $y = 3x^2 - 6x + 4$

$a = 3 \quad b = -6 \quad c = 4$

basic shape: $y = x^2$ ∪

Vertex: ~~general~~ general form "not readable"
$y = ax^2 + bx + c$

$h = \frac{-b}{2a}$

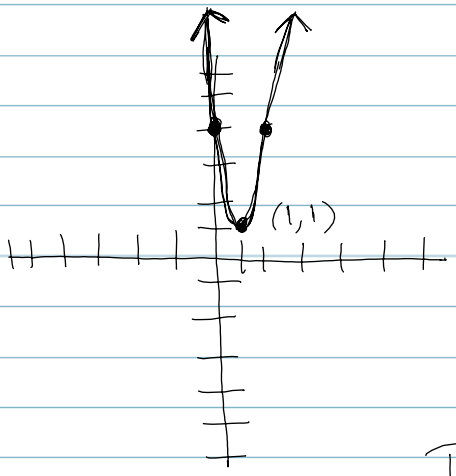
$h = \frac{-(-6)}{2(3)} = 1$

x	y
1	1

$k = 3(1)^2 - 6(1) + 4$
$3 - 6 + 4$
$= 1$

$(h, k) = (1, 1)$

x	y
0	4
1	1
2	4



$a = 3$ + up
stretched
narrow

D: $\mathbb{R}$ or $(-\infty, \infty)$

R: $[1, \infty)$

② $y = \frac{1}{2}(x-2)^2 - 3$

basic shape: $y = x^2$ ∪

vertex: $y = a(x-h)^2 + k$ = (2, −3) vertex

"readable"

$a = \frac{1}{2}$ + positive up

$\frac{1}{2}$ compressed (wider)

x	y
−1	1½
0	−1
1	−2½
2	−3
3	−2½
4	−1
5	1½

x = 3

$y = \frac{1}{2}(3-2)^2 - 3$

$= \frac{1}{2}(1)^2 - 3$

$= \frac{1}{2}(1) - 3$

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

$= -2\frac{1}{2}$

x = 4

$y = \frac{1}{2}(4-2)^2 - 3$

$= \frac{1}{2}(2)^2 - 3$

$= \frac{1}{2}(4) - 3$

$= 2 - 3$

$= -1$

x = 0

$y = \frac{1}{2}(0-2)^2 - 3$

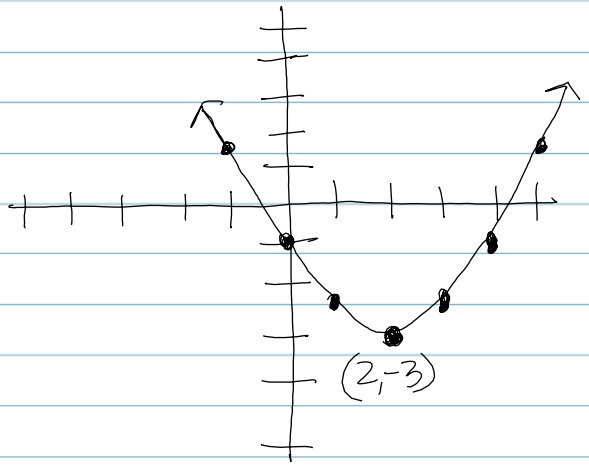
$= \frac{1}{2}(-2)^2 - 3$

$= \frac{1}{2}(4) - 3$

$= 2 - 3$

$= -1$

x = 5



vertex: (2, −3)

D: ℝ $(-\infty, \infty)$

R: $[-3, \infty)$

Sept. 19, 2012

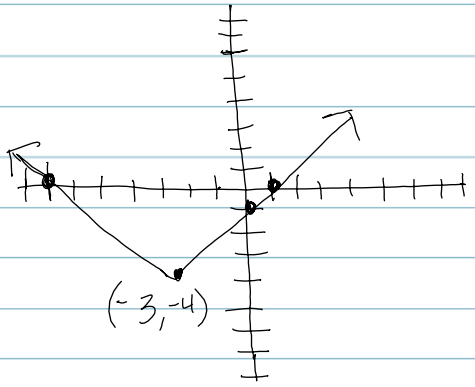
Absolute Value Function

Ex $y = |x+3| - 4$ basic shape: V $y = |x|$

Pattern: $y = a|x-h| + K$ "vertex": (h,k) $(-3,-4)$

$a = 1$ + up
1 neutral

x	y
-7	0
-6	-1
-5	-2
-4	-3
-3	-4
-2	-3
-1	-2
0	-1
1	0



D: $\mathbb{R}$

R: $[-4, \infty)$

$x = -2$

$y = |-2+3| - 4$
$y = |1| - 4$
$y = -3$

$x = -5$

$y = |-5+3| - 4$
$y = |-2| - 4$
$= 2 - 4$
$= -2$

$y = a(x-h)^3 + K$ FORMULA

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

basic shape: + $y = x^3$ −

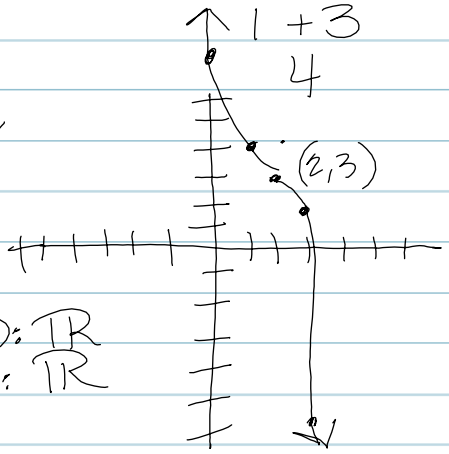
vertex: $(h,k) = (2,3)$

$a = -1$ − downhill
1 neutral

x	y
4	-5
3	2
2	3
1	4
0	11

$x = 1$

$y = -1(1-2)^3 + 3$
$-1(-1)^3 + 3$
$-1(-1) + 3$
$1 + 3$
4



D: $\mathbb{R}$
R: $\mathbb{R}$