

$$\boxed{6.3} \quad y - k = a(x - h)^2$$

left \Rightarrow neg "h"

Right \Rightarrow pos "h"

up \Rightarrow pos "k"

Down \Rightarrow neg "k"

$$y = \frac{1}{a}x^2$$

$$h = 3$$

$$k = -4$$

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

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

vertex (h, k)

$$(3, -4)$$

$$y - k = a(x - h)^2$$

⑦

$$y = \frac{4}{a} x^2$$

-3, 5
 \uparrow \uparrow
 h k

a)

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

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

$$b) x = h$$

$$x = -3$$

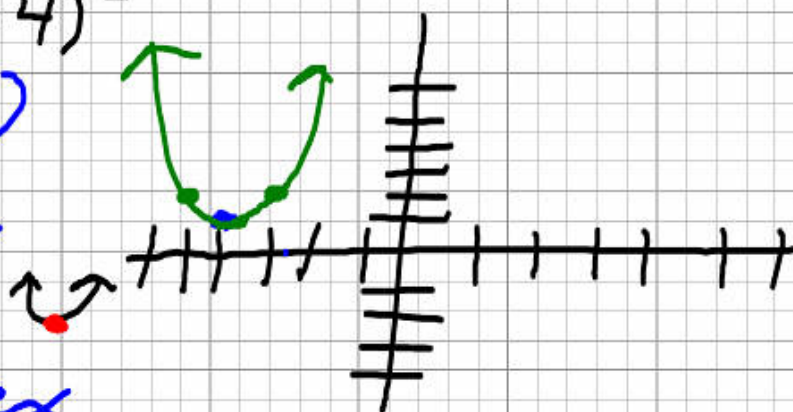
$$\boxed{14} \quad y - k = a(x - h)^2$$

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

Vertex $(-4, 1)$
 h k

$a > 0$, vertex
 minimum

$a < 0$, vertex
 maximum



X	Y
-5	2
-3	2

$$y - 1 = (-5 + 4)^2$$

$$y - 1 = (-1)^2$$

$$y - 1 = 1, \quad y = 2$$

b.4 Standard Form of Quadratics

$$y = ax^2 + bx + c$$

- Start w/ vertex form:

$$y - k = a(x - h)^2$$

- move stuff around to end up w/ standard:

$$y = ax^2 + bx + c$$

ex $y+8 = 2(x+3)^2$

	$x+3$	
x	x^2	$3x$
$+3$	$3x$	9

$$y+8 = 2(x^2 + 6x + 9)$$

$$y+8 = 2x^2 + 12x + 18$$

$$\begin{array}{r} -8 \\ \hline \end{array} \qquad \begin{array}{r} -8 \\ \hline \end{array}$$

$$y = 2x^2 + 12x + 10$$

..

ex2 $y - 4 = 3(x + 2)^2$

$$\begin{array}{r}
 x + 2 \\
 \times \begin{array}{|c|c|} \hline x^2 & 2x \\ \hline 2x & 4 \\ \hline \end{array} \\
 + 2
 \end{array}$$

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

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

$$+ 12x + 12$$

$$+ 4 + 4$$

$$y = 3x^2 + 12x + 16$$

ex 3

	x	$+5$
x	x^2	$5x$
$+5$	$5x$	25

$$y-4 = -2(x+5)^2$$

$$y-4 = -2(x^2+10x+25)$$

$$y-4 = -2x^2 - 20x - 50$$

$$y = -2x^2 - 20x - 46$$

application:

ex 4

$$h = -16t^2 + 44t + 5$$

$h = \text{height}$
 $t = \text{sec}$

↑ initial height

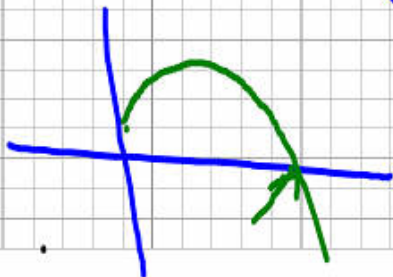
a) $t = 0, 1, 2, 3$

t	h
0	5
1	33
2	29
3	7

$$-16(3)^2 + 44(3) + 5$$

$$-144 + 132 + 5$$

$$0 = -16t^2 + 44t + 5$$



Accel. due to gravity:

$$g = 32 \text{ ft/sec}^2$$

$$g = 9.8 \text{ m/sec}^2$$

$$\underline{h} = -\frac{1}{2} \boxed{g} \underline{t}^2 + \boxed{V_0} t + \boxed{h_0}$$

height time initial velocity
(dropped = 0) initial height