

Vertex Form
 $y = a(x-h)^2 + k$
 Vertex (h, k) Completing
 the Square

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

Vertex
 (x, y) To find x -value
 $y = ax^2 + bx + c$

$$b = -6$$

$$a = -1$$

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

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

$$x = \frac{6}{-2}$$

Vertex
 $(-3, y)$ To find y substitute
 into $y =$

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

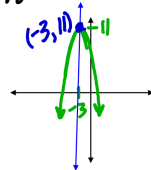
$$y = -(-3)^2 - 6(-3) + 2$$

$$y = -9 + 18 + 2$$

$$y = 11$$

$$\left. \begin{array}{l} -(-3)^2 \\ -1(-3)^2 \\ -1(9) \\ -9 \end{array} \right\}$$

Vertex $(-3, 11)$



Axis of Symmetry $x = -3$
 Vertical line equation

$$y = -1 - 8x + 12x^2$$

$$y = 12x^2 - 8x - 1$$

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

$$x = \frac{-8}{2(12)}$$

$$x = \frac{8}{24}$$

$$x = \frac{1}{3}$$

Vertex
($\frac{1}{3}$, y)

$$\begin{aligned} a &= 12 \\ b &= -8 \\ c &= -1 \end{aligned}$$

$$y = 12x^2 - 8x - 1$$

$$y = 12\left(\frac{1}{3}\right)^2 - 8\left(\frac{1}{3}\right) - 1$$

$$y = 12\left(\frac{1}{9}\right) - \frac{8}{3} - 1$$

$$y = \frac{4}{3} - \frac{8}{3} - \frac{3}{3}$$

$$y = -\frac{7}{3}$$

Vertex ($\frac{1}{3}$, $-\frac{7}{3}$)

Axis of Symmetry $x = \frac{1}{3}$

p 312
49,50

$$h(t) = -16t^2 + 192t$$

$$x = \frac{-b}{2a} \quad \begin{array}{l} a = -16 \\ b = 192 \end{array} \quad x = \frac{-192}{2(-16)}$$

(6, 576)

$$x = \frac{-192}{-32}$$

(t, h)
time, height

6 sec.

$$x = 6$$

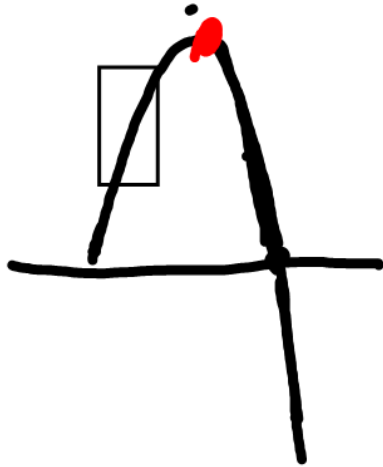
$$h(6) = -16(6)^2 + 192(6)$$

$$h(6) = -576 + 1152$$

function $h(6) = 576$

576 feet

$$P(x) = -.3x^2 + 75x - 2000$$



p 310
26-46 E