

p. 223 #10 write quadratic
fcn in standard form;

3 points:

$$(3, -6), (1, -2), (6, 3)$$

| x^2 | x | 1 | y |
|-------|-----|---|-----|
| 9 | 3 | 1 | -6 |
| 1 | 1 | 1 | -2 |
| 36 | 6 | 1 | 3 |

$$\text{rref} \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & -6 \\ 0 & 0 & 1 & 3 \end{bmatrix} \begin{matrix} a \\ b \\ c \end{matrix}$$

Answer: $y = ax^2 + bx + c$
 $y = x^2 - 6x + 3$

p. 218 #1 write in vertex form

$$y = x^2 - 2x + 9$$

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

$$a = 1$$

$$h = -\frac{b}{2a} = -\frac{-2}{2} = 1$$

$$h = 1$$

$$h = 1$$

$$k = 8$$

$$k = h^2 - 2h + 9$$

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

$$= 1 - 2 + 9$$

$$y = 1(x-1)^2 + 8$$

$$k = 8$$

$$y = (x-1)^2 + 8$$

#7 p. 218 write in vertex form

$$y = 2x^2 - 5x + 12$$

need: a, h, k

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

$$h = -\frac{b}{2a} = \frac{5}{4} \quad h = \frac{5}{4}$$

$$k = \frac{71}{8}$$

$$\begin{aligned} k &= 2\left(\frac{5}{4}\right)^2 - 5\left(\frac{5}{4}\right) + 12 \\ &= \frac{50}{16} - \frac{25}{4} + \frac{96}{8} \\ &= \frac{25}{8} - \frac{50}{8} + \frac{96}{8} \\ &= \frac{71}{8} \end{aligned}$$

$$y = 2\left(x - \frac{5}{4}\right)^2 + \frac{71}{8}$$

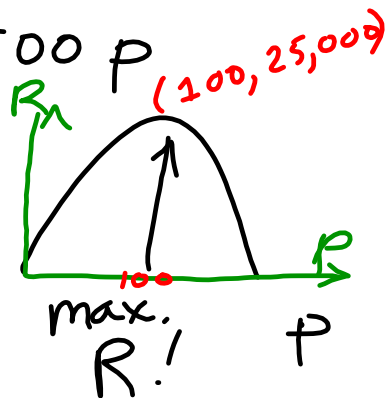
#9. $R = -2.5p^2 + 500p$

vertex = (h, k)

$$h = -\frac{b}{2a} = -\frac{500}{-5}$$

$$= 100$$

price \$100



Revenue: $-2.5(100)^2 + 500(100)$

$$= -25,000 + 50,000$$

\$25,000

$$\begin{aligned} \#10 \text{ box } P &= 36 \text{ cm} \\ &= 2L + 2W \\ H &= 4 \text{ cm.} \\ &\text{max. volume.} \end{aligned}$$

$$V = \text{volume}$$

$$V = H \cdot W \cdot L$$

$$36 = 2L + 2W$$

$$18 = L + W$$

$$W = 18 - L$$

$$V = 4 \cdot (18 - L) \cdot L$$

$$= 4 \cdot L(18 - L)$$

$$= 72L - 4L^2$$

$$V = -4L^2 + 72L$$

$$\frac{-b}{2a} = \frac{-72}{-8} = 9 = L$$

$$\#11 \quad y = x^2 + bx + c \quad (3, -4) \quad (h, k)$$

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

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

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

$$-b = 6$$

$$b = -6$$

$$a = 1$$

$$b = -6$$

$$c = 5$$

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

$$-4 = 9 - 18 + c$$

$$-4 = -9 + c$$

$$5 = c$$

p. 218 # 14

$$y = c - ax^2 - 2x$$

vertex $(-1, 3)$

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

$$-1 = -\frac{-2}{2 \cdot (-a)} \quad \begin{array}{l} a \quad 1 \\ b \quad -2 \\ c \quad 2 \end{array}$$

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

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

$$1 = \frac{1}{a}$$

$$a = 1$$

$$y = c - ax^2 - 2x \quad (-1, 3)$$

$$3 = c - 1(-1)^2 - 2(-1)$$

$$3 = c - 1 + 2$$

$$3 = c + 1$$

$$c = 2$$

$$a = 1, c = 2$$

#15 $\uparrow v_0 = 64 \text{ ft/s}$
 $h = 64t - 16t^2 \text{ ft}$
 $t, \text{ s}$

highest point @ vertex of
 $h(t) = -16t^2 + 64t$

$$a = -16$$

$$b = 64$$

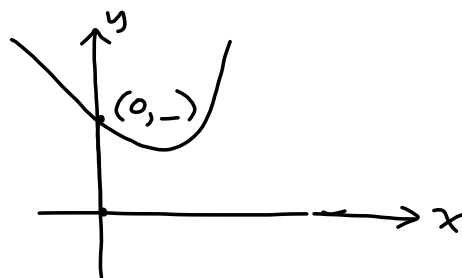
(a) t @ vertex: $-\frac{b}{2a}$
 $-\frac{b}{2a} \begin{matrix} b=64 \\ a=-16 \end{matrix} \rightarrow = \frac{-64}{-32} = 2 \text{ s}$
 takes 2 s. to reach maximum height

(b) height when $t = 2 \text{ s}$:
 $h(2) = -16(2)^2 + 64(2)$
 $= -64 + 128 = 64 \text{ ft}$

#18-20 y-intercept.

Two ways:

① plug in $x = 0$



② standard form?
 y-intercept is = C

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