

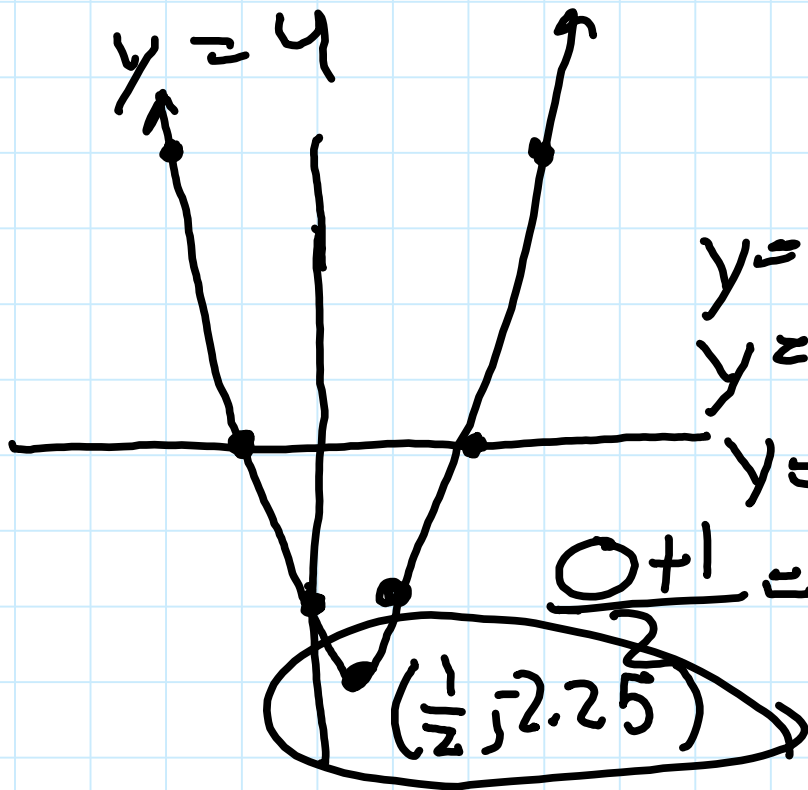
1) $y = x^2 - x - 2$

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

$y = 4 + 2 - 2$

$y = 4$

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



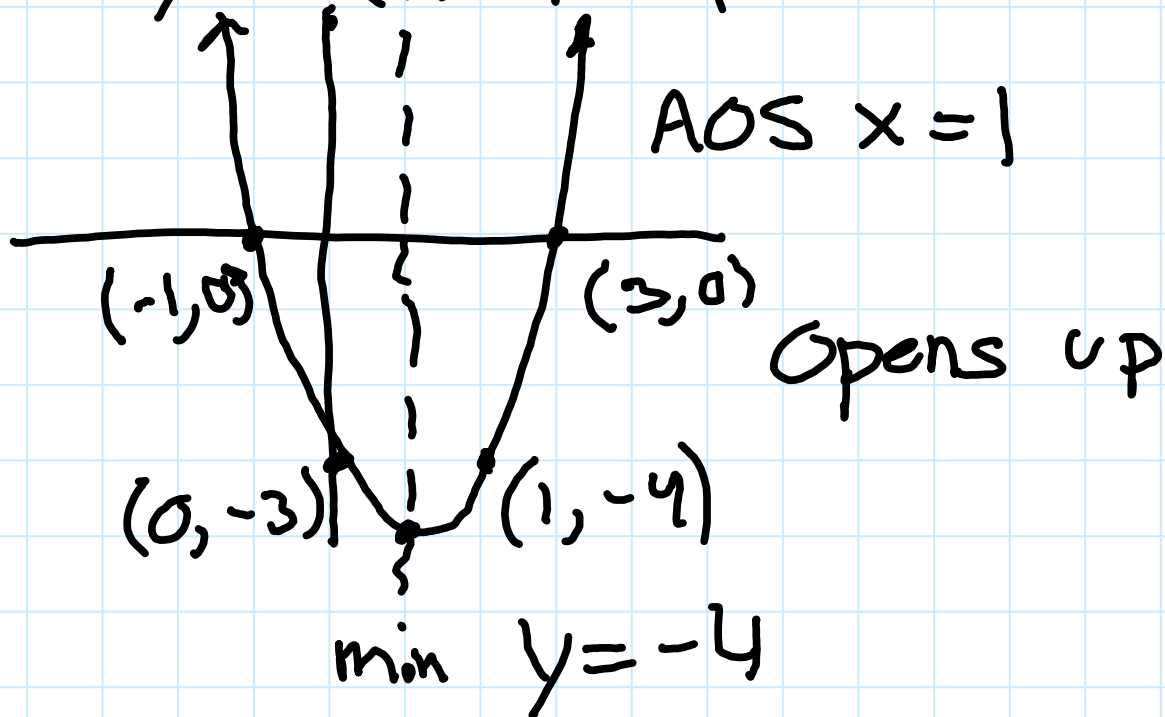
$y = x^2 - x - 2$
 $y = \left(\frac{1}{2}\right)^2 - \left(\frac{1}{2}\right) - 2$
 $y = -2.25$

$\frac{0+1}{2} = \frac{1}{2}$

$\left(\frac{1}{2}, -2.25\right)$

$$2a) y = (x-1)^2 - 4 \quad v: (1, -4)$$

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

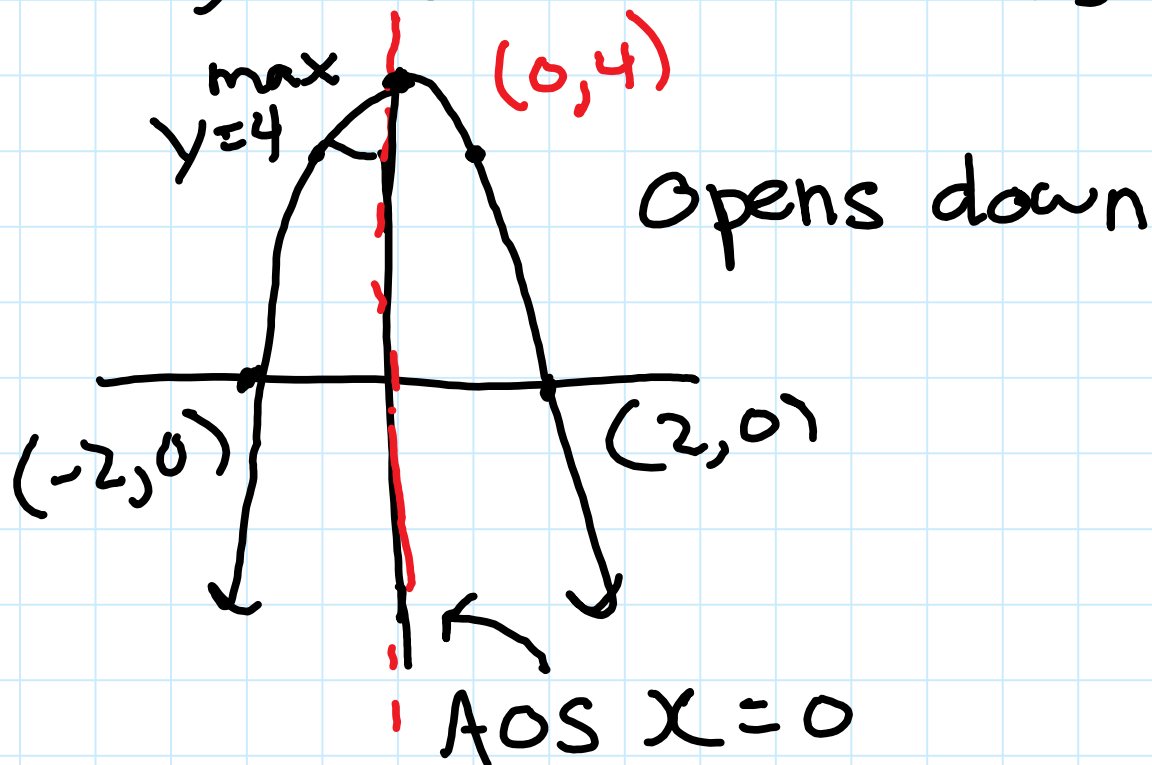


$$D: x \in \mathbb{R}$$

$$R: y \geq -4$$

$$2b) \quad y = -x^2 + 4$$

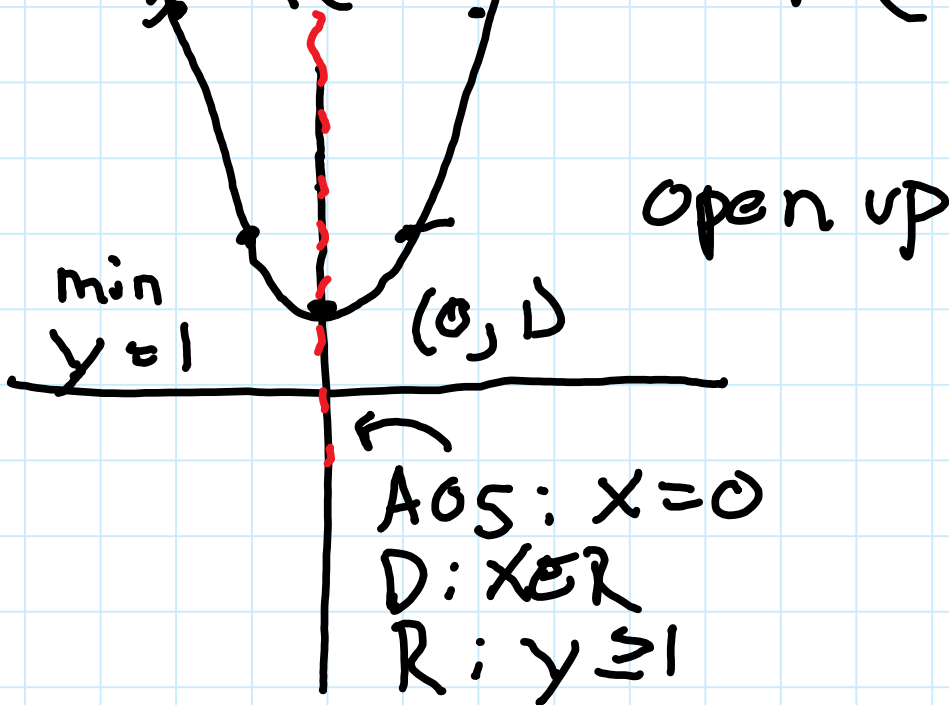
$$y = -(x-0)^2 + 4 \quad V: (0, 4)$$



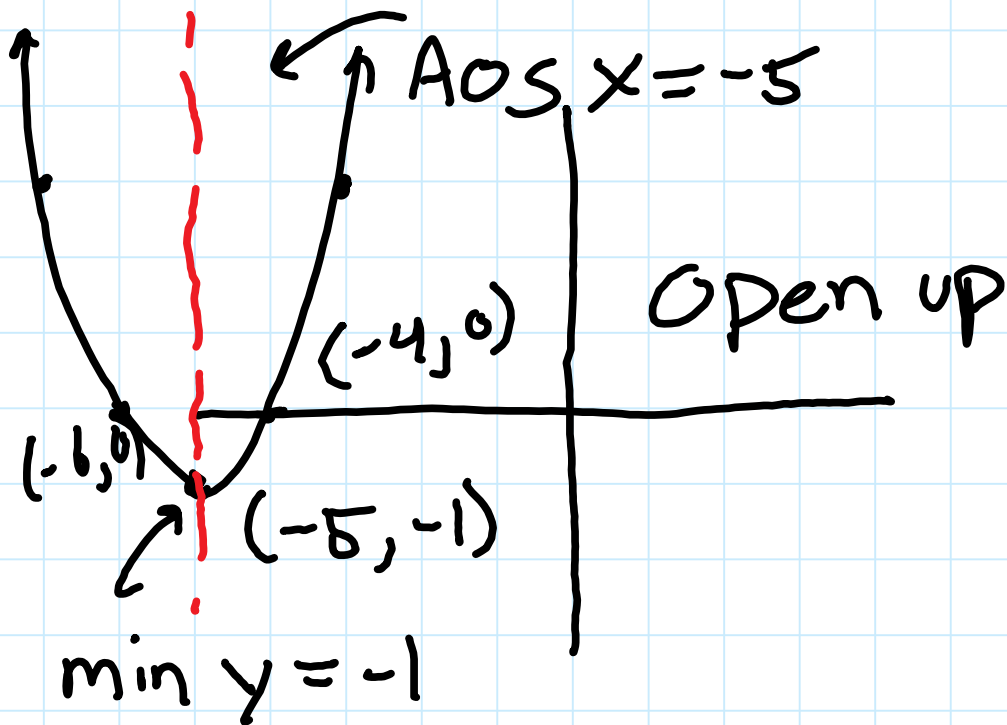
$$D: x \in \mathbb{R}$$
$$R: y \leq 4$$

$$2c) y = x^2 + 1$$

$$y = 1(x+0)^2 + 1 \quad v: (0, 1)$$

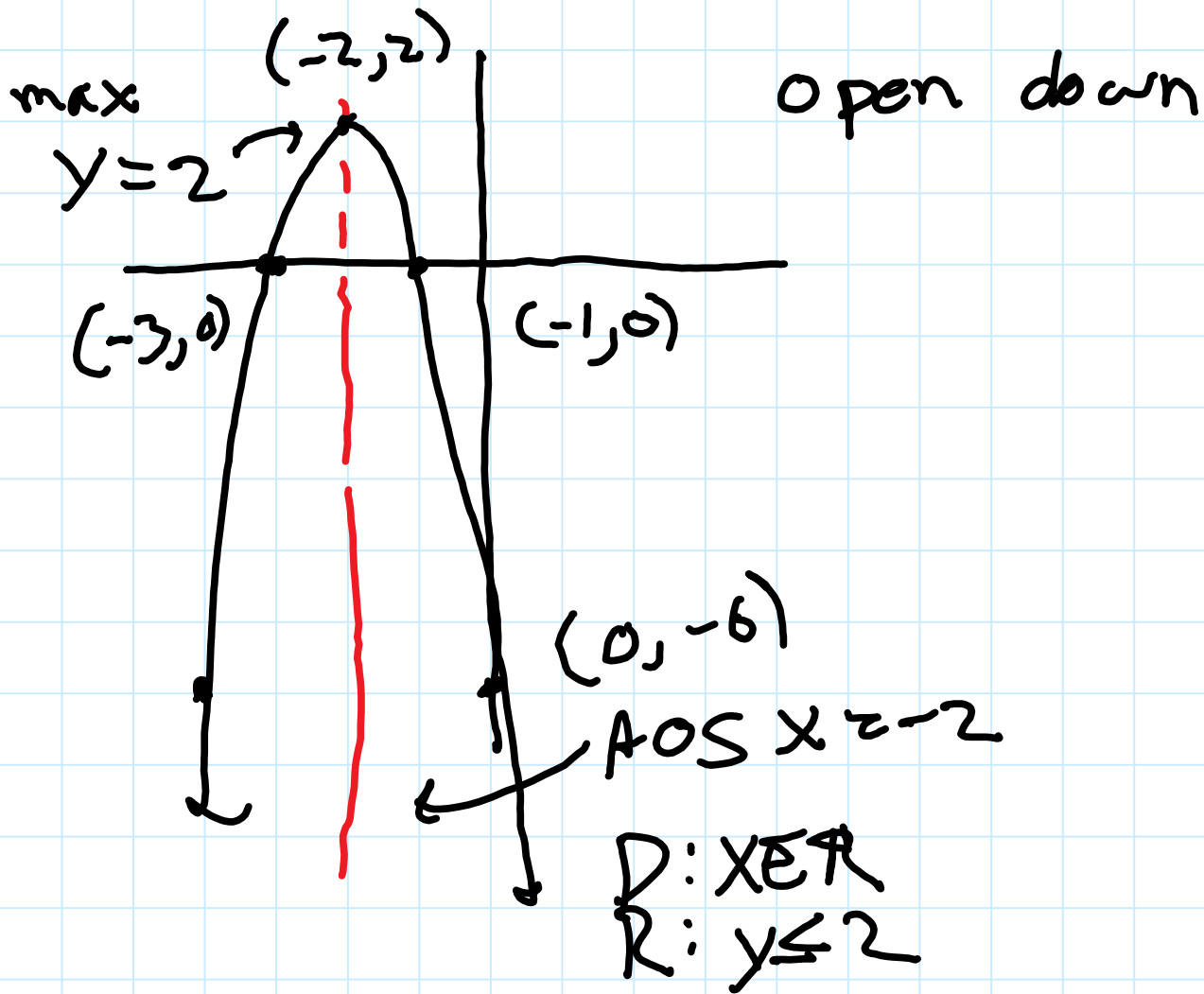


2d) $y = (x + 5)^2 - 1$ V: $(-5, -1)$



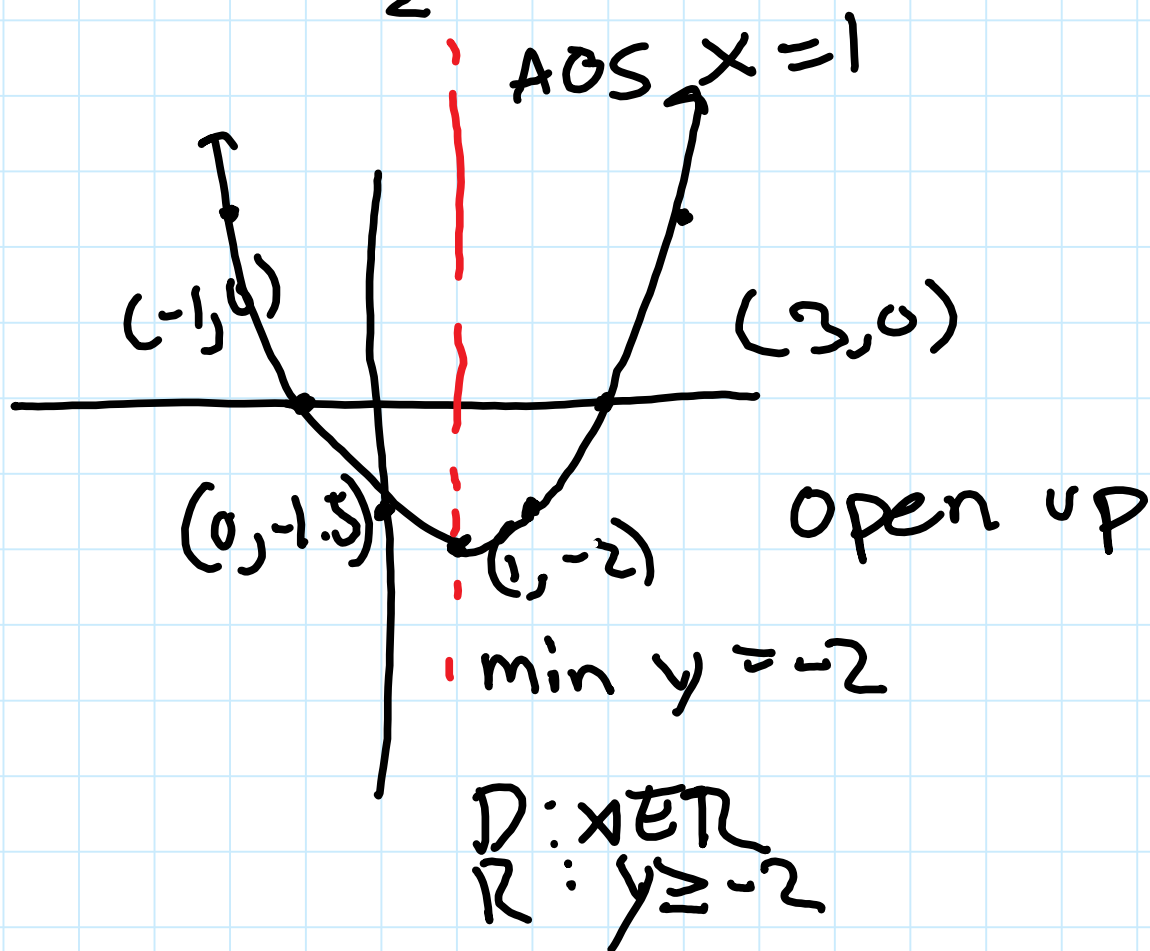
D: $x \in \mathbb{R}$
R: $y \geq -1$

2e) $y = -2(x+2)^2 + 2$ v: $(-2, 2)$



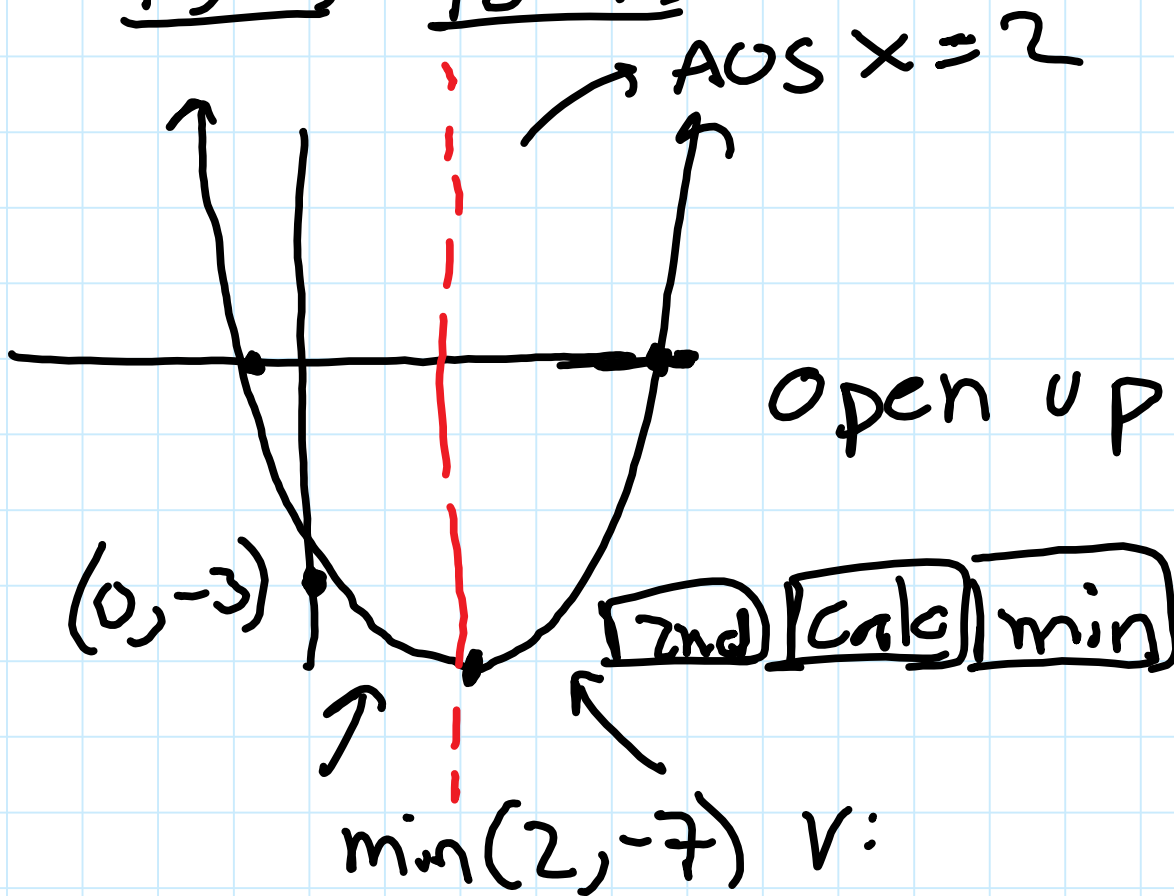
C11 - 3.0 - Q2f Quadratics Review

25) $y = \frac{1}{2}(x-1)^2 - 2$ $V: (1, -2)$



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

$y =$ graph



D: $x \in \mathbb{R}$
R: $y \geq -7$

$$3b) \quad y = (2x^2 - 8x) + 9$$

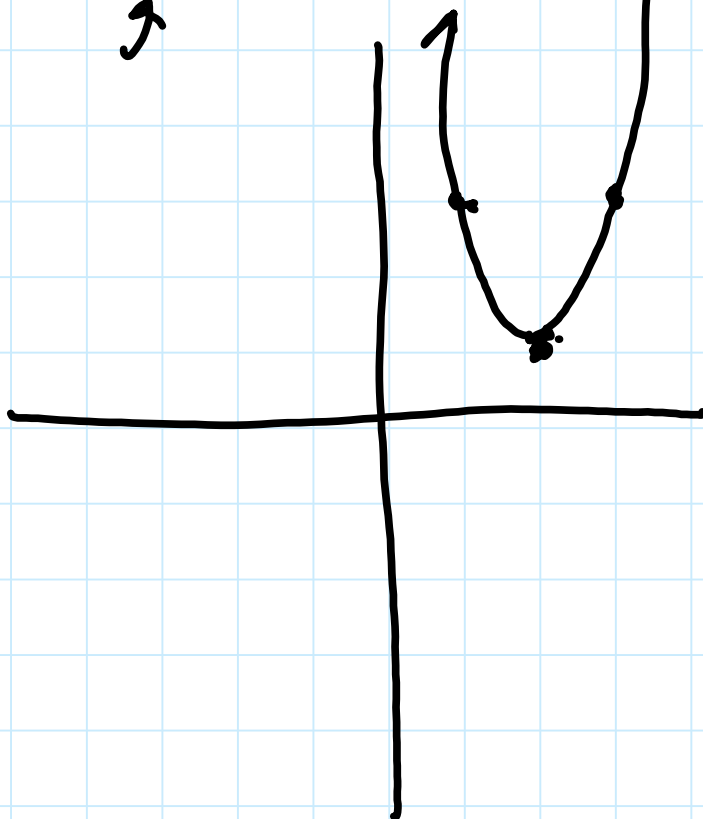
$$y = 2(x^2 - 4x) + 9$$

$$y = 2(x^2 - 4x + 4 - 4) + 9$$

$$y = 2(x^2 - 4x + 4) - 8 + 9$$

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

$$y = 2(x - 2)^2 + 1 \quad \uparrow \quad V: (2, 1)$$



$$\left(\frac{b}{2a}\right)^2$$

$$\left(\frac{-4}{2}\right)^2$$

$$(-2)^2$$

$$= 4$$

$$3c) \quad y = (x^2 + 8x)$$

$$y = (x^2 + 8x + 16) - 16$$

$$y = (x+4)(x+4) - 16$$

$$y = (x+4)^2 - 16$$

$$V: (-4, -16)$$

$$\begin{aligned} & \left(\frac{b}{2}\right)^2 \\ & \left(\frac{8}{2}\right)^2 \\ & (4)^2 \\ & = 16 \end{aligned}$$

$$\begin{aligned}
 3d) \quad y &= \left(\frac{1}{2}x^2 + 4x\right) + 2 && \left(\frac{b}{2}\right)^2 \\
 y &= \frac{1}{2}(x^2 + 8x) + 2 && \left(\frac{8}{2}\right)^2 \\
 y &= \frac{1}{2}(x^2 + 8x + 16) - 16 + 2 && (4)^2 \\
 y &= \frac{1}{2}(x+4)(x+4) - 8 + 2 && = 16 \\
 y &= \frac{1}{2}(x+4)^2 - 6 && V: (-4, -6)
 \end{aligned}$$

$$3e) y = \left(\frac{1}{2}x^2 + \frac{1}{4}x\right) + 2$$

$$y = \frac{1}{2}\left(x^2 + \frac{1}{2}x\right) + 2$$

$$y = \frac{1}{2}\left(x^2 + \frac{1}{2}x + \frac{1}{16}\right) - \frac{1}{16} + 2$$

$$y = \frac{1}{2}\left(x + \frac{1}{4}\right)\left(x + \frac{1}{4}\right) - \frac{1}{32} + 2$$

$$y = \frac{1}{2}\left(x + \frac{1}{4}\right)^2 - \frac{1}{32} + \frac{2}{1} \times 32$$

$$y = \frac{1}{2}\left(x + \frac{1}{4}\right)^2 + \frac{63}{32}$$

$$- \frac{1}{32} + \frac{64}{32}$$

$$= \frac{63}{32}$$

$$V: -\frac{1}{4}, \frac{63}{32}$$

$$\left(\frac{1}{2} \div \frac{1}{2}\right)^2$$

$$\left(\frac{1}{2} - \frac{1}{2}\right)^2$$

$$\left(\frac{1}{4}\right)^2$$

$$= \frac{1}{16}$$

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

$$y = 4\left(-\frac{1}{4}\right)^2 + 2\left(-\frac{1}{4}\right) - 1$$

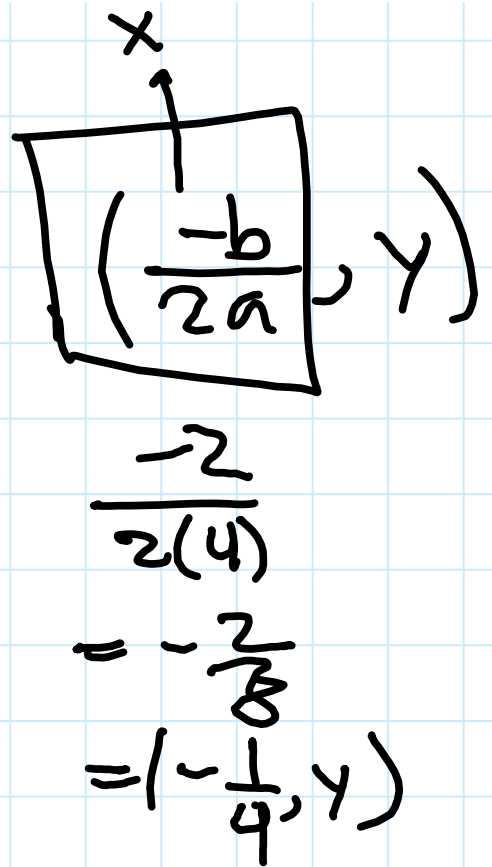
$$y = 4\left(\frac{1}{16}\right) - \frac{1}{2} - 1$$

$$y = \frac{1}{4} - \frac{1}{2} - 1$$

$$y = \frac{1}{4} - \frac{2}{4} - \frac{4}{4} = \frac{5}{4}$$

$$y = -\frac{5}{4}$$

$$V: \left(-\frac{1}{4}, -\frac{5}{4}\right)$$



$$\left(\frac{-b}{2a}, y\right)$$

$$\rightarrow \frac{-2}{2(4)}$$

$$= -\frac{2}{8}$$

$$= -\frac{1}{4}, y)$$

$$5a) y = x^2 \quad f(x) = x^2$$

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

↑ left 1 ↑ down 3

$$b) y = 2(x-2)^2 - 5$$

↑ vertical expansion 2 ↑ right 2 ↓ down 5

$$6a) \quad V: (3, -2) \quad P(2, 6)$$

$$y = a(x - p)^2 + q$$

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

$$6 = a(2 - 3)^2 - 2$$

$$6 = 1a - 2$$

$$+2 \quad +2$$

$$8 = a$$

$$y = 8(x - 3)^2 - 2$$

$$6b) \quad v: (1, 1) \quad \text{y int } (0, -2)$$

$$y = a(x - p)^2 + q$$

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

$$-2 = a(0 - 1)^2 + 1$$

$$-2 = 1a + 1$$

$$-3 = a$$

$$-3 = a$$

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

$$6c) \quad v: (-2, -1) \quad p: (-4, 1)$$

$$y = a(x - p)^2 + q$$

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

$$1 = a(-4 + 2)^2 - 1$$

$$1 = 4a - 1$$

$$\frac{2}{4} = \frac{4a}{4}$$

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

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

6d) X-ints $(-1, 0)$ $(3, 0)$ $R: y \geq -4$

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

$$V: (1, -4)$$

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

$$y = a(x-p)^2 + q$$

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

$$0 = a(3-1)^2 - 4$$

$$0 = 4a - 4$$

$$+4 \quad +4$$

$$4 = 4a$$

$$4 \quad 4$$

$$a = 1$$

6e) AOS $x=1$ MAX $y=8$ y Int. $(0, b)$ ^{x, y}

$$V: (1, 8)$$

$$y = a(x - p)^2 + q$$

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

$$6 = a(0 - 1)^2 + 8$$

$$6 = 1a + 8$$

$$-8 \quad -8$$

$$-2 = a$$

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

(2, y)

$$65) \quad p \left(\overset{x}{1}, \overset{y}{-2} \right) \left(\overset{x}{3}, \overset{y}{-2} \right) \left(\overset{x}{4}, \overset{y}{4} \right) \quad \frac{HS}{2} = 2$$

$$y = a(x-p)^2 + q$$

$$y = a(x-p)^2 + q$$

$$y = a(x-2)^2 + q$$

$$y = a(x-2)^2 + q$$

$$-2 = a(1-2)^2 + q$$

$$4 = a(4-2)^2 + q$$

$$-2 = 1a + q$$

$$4 = 4a + q$$

$$\begin{array}{r} -2 = 1a + q \\ (4 = 4a + q) \\ \hline -6 = -3a \\ \underline{-3} \quad \underline{-3} \\ a = 2 \end{array}$$

$$\begin{array}{r} 4 = 4(2) + q \\ 4 = 8 + q \\ -8 \quad -8 \\ \hline q = -4 \end{array}$$

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

7a) let $a = 1st^{th}$ let $b = 2nd^{th}$

$$a - b = 10$$

$$+b \quad +b$$

$$a = (10 + b)$$

$$a(2b) = \text{min}$$

$$(10 + b)(2b) = \text{min}$$

$$(2b^2 + 20b)$$

$$2(b^2 + 10b + 25) - 25 \left(\frac{b}{2}\right)^2$$

$$2(b+5)(b+5) - 50$$

$$\left(\frac{10}{2}\right)^2 = 25$$

$$2(b+5)^2 - 50$$

$$V: (-5, -50)$$



$$a = 10 + b$$

$$a = 10 - 5$$

$$a = 5$$

$$a = 5 \quad b = -5$$

$$\text{min} = -50$$

$$5 - (-5) = 10$$

$$5 \cdot (2(-5)) = -50$$

$$7b) \text{ let } a = 15 \text{ ft} \quad \text{let } b = 2 \text{ ft} \quad \left(\frac{a}{2}\right)^2$$

$$a + b = 8$$

$$\quad -b \quad -b$$

$$a = (8 - b)$$

$$(a^2 + b^2) = \text{min}$$

$$\left(\frac{8}{2}\right)^2$$

$$= 16$$

$$(8 - b)^2 + b^2$$

$$(8 - b)(8 - b) + b^2$$

$$64 - 16b + b^2 + b^2$$

$$(2b^2 - 16b) + 64 \quad \times 2$$

$$2(b^2 - 8b + 16) - 16 + 64$$

$$2(b - 4)(b - 4) - 32 + 64$$

$$2(b - 4)^2 + 32$$

$$a = (8 - b)$$

$$a = (8 - 4)$$

$$a = 4$$

$$v: (4, 32)$$

\downarrow
b \rightarrow min

$$a = 4 \quad b = 4$$

$$\text{min} = 32$$

$$4 + 4 = 8 \quad \checkmark$$

$$4^2 + 4^2 = 32 \quad \checkmark$$

8a)



$$\left(\frac{b}{2}\right)^2$$

$$\left(\frac{-20}{2}\right)^2$$

$$= 100$$

$$P = 2L + w$$

$$A = L(w)$$

$$A = L(40 - 2L)$$

$$40 = 2L + w$$

$$-2L \quad -2L$$

$$w = (40 - 2L)$$

$$(-2L^2 + 40L)$$

$$-2(L^2 - 20L) \quad \times 2$$

$$-2(L^2 - 20L + 100) + 200$$

$$-2(L - 10)(L - 10) + 200$$

$$-2(L - 10)^2 + 200$$

$$w = (40 - 2L)$$

$$w = (40 - 2(10))$$

$$w = 20$$

$$V: (10, 200)$$

L

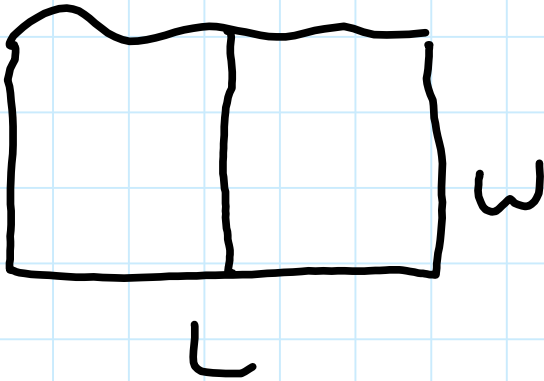
A

$$w = 20_m \quad L = 10_m \quad A = 200_m^2$$

$$20 + 10 + 10 = 40 \checkmark$$

$$20(10) = 200 \checkmark$$

8b)



$$\left(\frac{b}{2}\right)^2$$

$$\left(\frac{-14}{2}\right)^2$$

$$= 49$$

$$P = 3w + L$$

$$A = Lw$$

$$42 = 3w + L$$

$$\begin{matrix} -3w & -3w \\ L = (42 - 3w) \end{matrix}$$

$$A = (42 - 3w)w$$

$$A = (-3w^2 + 42w)$$

$$-3(w^2 - 14w + 49) - 49$$

$$-3(w-7)(w-7) + 147$$

$$-3(w-7)^2 + 147$$

$$V: (7, 147)$$

$$L = (42 - 3w)$$

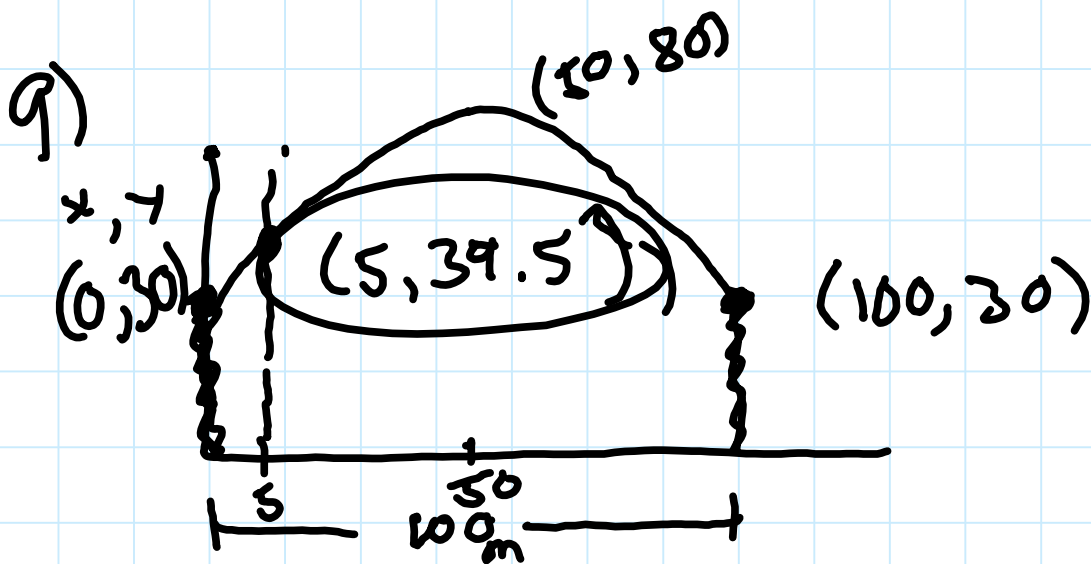
$$L = 42 - 3(7)$$

$$L = 21$$

$$L = 21 \text{ m } w = 7 \text{ m } A = 147 \text{ m}^2$$

$$21 + 7 + 7 + 7 = 42 \checkmark$$

$$21(7) = 147 \checkmark$$



$$y = a(x - 50)^2 + 80$$

$$30 = a(0 - 50)^2 + 80$$

$$30 = 2500a + 80$$

$$-80 \quad -80$$

$$\frac{-50}{2500} = \frac{2500a}{2500}$$

$$a = \frac{1}{50}$$

$$a = \frac{1}{50}$$

$$y = \frac{1}{50}(5 - 50)^2 + 80$$

$$y = 39.5$$

$$y = \frac{1}{50}(x - 50)^2 + 80$$

10) let $x = \#$ price increase

$$p = 10 + 1x$$

$$q = 6 - 1x$$

$$\left(\frac{b}{2}\right)^2$$

$$\left(\frac{4}{2}\right)^2$$

$$= 4$$

$$r = pq$$

$$r = (10 + 1x)(6 - 1x)$$

$$r = 60 - 10x + 6x - x^2$$

$$r = (-x^2 - 4x) + 60$$

$$r = -(x^2 + 4x + 4) - 4 + 60$$

$$r = -(x + 2)^2 + 64 \quad v: (-2, 64)$$

$$p = 10 - 2 \quad q = 6 + 2$$

$$p = 8$$

$$q = 8$$

decrease price
two times

$$r = 8(8) = 64$$

$$11) a \quad h = (-2d^2 + 8d) + 10$$

$$h = -2(d^2 - 4d + 4) - 4 + 10$$

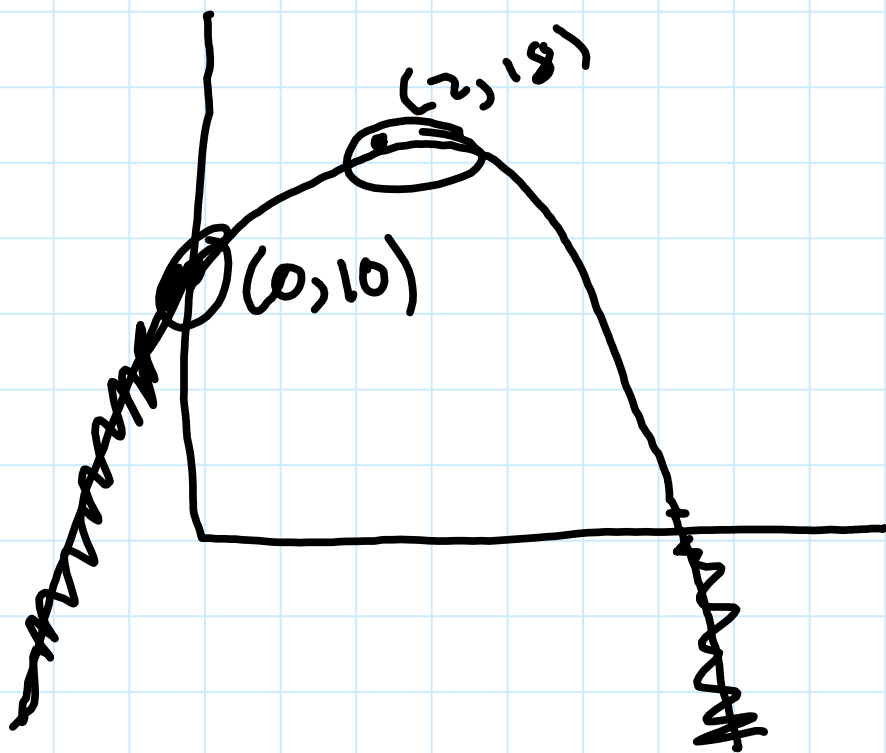
$$h = -2(d-2)^2 + 18$$

$$\left(\frac{b}{2}\right)^2$$

$$\left(\frac{-4}{2}\right)^2$$

$$= 4$$

$$d = 0$$



$$h = -2d^2 + 8d + 10$$

$$h = 10$$

$$11b) \quad h = -4.9t^2 + 50t + 1$$

Y=

Graph

Zoom 6

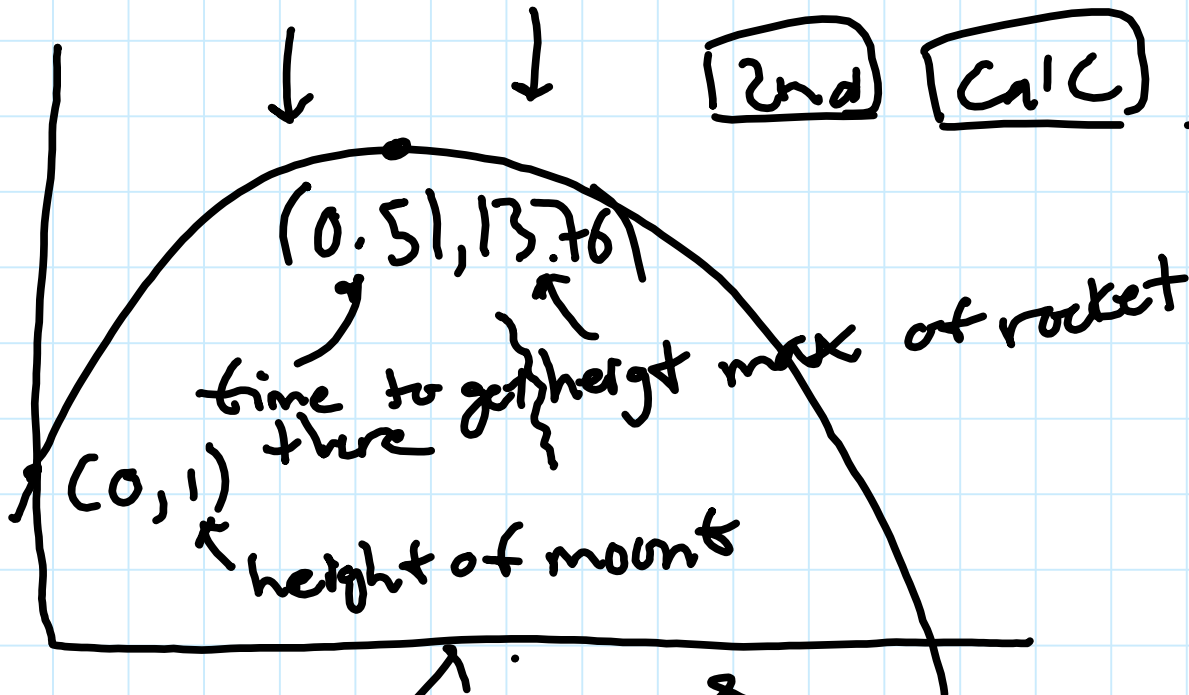
Window

$y_{\max} \rightarrow 20$

2nd

Calc

max



$$h = -4.9t^2 + 50t + 1 \quad t=0$$

$$h = 1$$