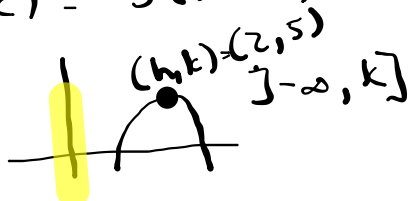


## Quad Fns

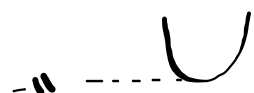
#1 a)  $f(x) = -3(x-2)^2 + 5$



dom  $f \bullet ]-\infty, +\infty[$   
 $\mathbb{R}$

ran  $f : ]-\infty, 5]$

b)  $f(x) = 2x^2 + 4x - 9$



$$k = \frac{4ac - b^2}{4a} = \frac{4(2)(-9) - 4^2}{4(2)}$$

dom  $f \bullet \mathbb{R}$

ran  $f : [-11, +\infty[$

#2  $f(x) = -3(x+1)^2 + 12$

$$0 = -3(x+1)^2 + 12$$

$$\frac{-12}{-3} = \frac{-3(x+1)^2}{-3}$$

$$\sqrt{4} = \sqrt{(x+1)^2}$$

$$\pm 2 = x+1$$

$$\underbrace{\cup}_{\cap} \rightarrow \cup$$

Case 1

$$2 = x+1$$

$$1 = x$$

Case 2

$$-2 = x+1$$

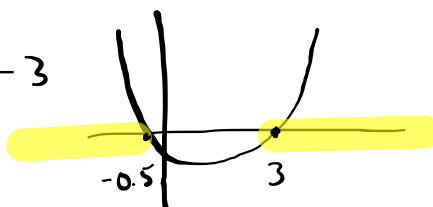
$$-3 = x$$

$$\begin{aligned}
 \#3 \quad f(x) &= -\frac{1}{2}(x+4)^2 + 9 \\
 &= -\frac{1}{2}(0+4)^2 + 9 \\
 &= -\frac{1}{2}(4)^2 + 9 \\
 &= -8 + 9 = 1
 \end{aligned}$$

$$\#4 \quad f(x) = 2x^2 - 5x - 3$$

$$m+n = -6$$

$$m+n = -5$$



$$\text{+ve } ]-\infty, -0.5] \cup [3, +\infty[$$

$$2x^2 + bx - 6x - 3 = 0$$

$$x(2x+1) - 3(2x+1) = 0$$

$$(x-3)(2x+1) = 0$$

Case 1

$$x-3=0$$

$$x=3$$

Case 2

$$2x+1=0$$

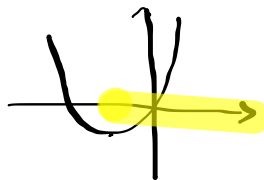
$$x = -\frac{1}{2}$$

#5

$$f(x) = 3x^2 + 6x - 5$$

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

$$\uparrow [-1, +\infty[$$



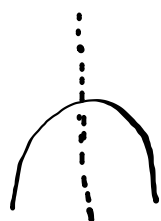
#6

$$f(x) = -2x^2 + 12x - 7$$

$$k = \frac{4ac - b^2}{4a} = 11$$



#7



$$x = h$$

$$x = 6$$

#8

$$-7 = -3(x+4)^2 + 5$$

$$-12 = -3(x+4)^2$$

$$4 = (x+4)^2$$

$$\pm 2 = x + 4$$

Case 1

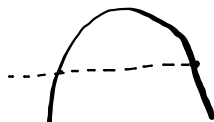
$$2 = x + 4$$

$$-2 = x$$

Case 2

$$-2 = x + 4$$

$$-6 = x$$



•

#9  $V(-1, 5)$   $P(1, 3)$

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

$$3 = a(1+1)^2 + 5$$

$$-2 = 4a$$

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

$$f(x) = -\frac{1}{2}(x+1)^2 + 5$$

#10  $h = -t^2 + 12t + 160$

$$180 = t^2 + 12t + 160$$

$$t^2 - 12t + 20 = 0$$

$$(x-2)(x-10) = 0 \quad \begin{array}{l} m \cdot n = 20 \\ m + n = -12 \end{array}$$

Case 1

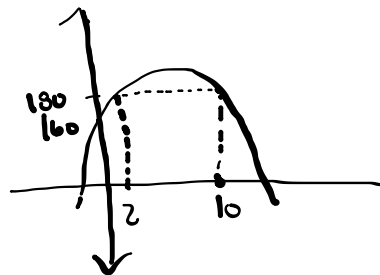
$$x-2=0$$

$$x=2$$

Case 2

$$x-10=0$$

$$x=10$$



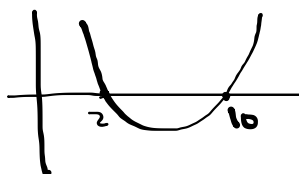
$[2, 10]$

#11

$$h = \frac{1}{2}t^2 - 6t + 10$$

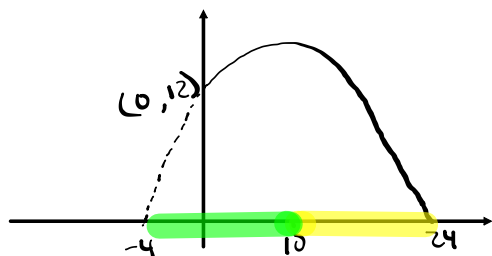
$$0 = t^2 - 12t + 20$$

$$(x-2)(x-10)$$



$$t = 10 - 2 = 8 \text{ sec}$$

#12



$$\begin{aligned} \textcircled{1} f(x) &= a(x-x_1)(x-x_2) & 24-10 &= 14 \\ & & 10-14 &= -4 \\ 12 &= a(0+4)(0-24) \\ 12 &= -96a \\ -0.125 &= a \end{aligned}$$

$$\begin{aligned} \textcircled{2} f(x) &= -0.125(x+4)(x-24) \\ 6.5 &= -0.125(x+4)(x-24) \\ 6.5 &= -0.125(x^2 - 20x - 96) \\ 0 &= -0.125x^2 + 2.5x + 12 - 6.5 \\ -8(0 &= -0.125x^2 + 2.5x + 5.5) \\ 0 &= x^2 - 20x - 44 \\ &= (x-22) \end{aligned}$$

$$\begin{aligned} -0.125 &= \left(-\frac{1}{8}\right)^8 \\ &= 1 \end{aligned}$$

$$t = 24 - 22 = 2 \text{ sec}$$

Homework

Textbook Vol 1

P 229 # 1, 2 + 4

P 230 # 6