

1.

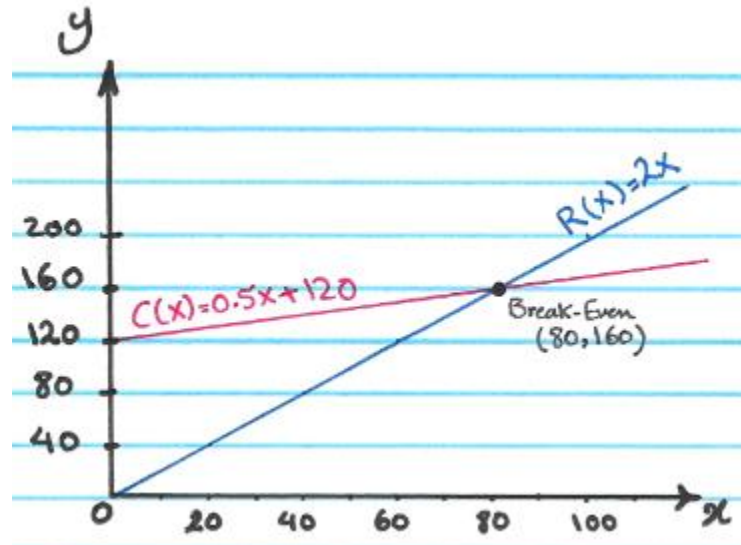
a. $C(x) = 0.5x + 120$
 $R(x) = 2x$

b. Break-even point occurs when $C(x) = R(x)$
Therefore $\rightarrow 0.5x + 120 = 2x \rightarrow$ subtract both sides by $0.5x \rightarrow$
 $2x - 0.5x = 120 \rightarrow 1.5x = 120 \Rightarrow x = \frac{120}{1.5} = 80$
 Break-even point = 80 cups

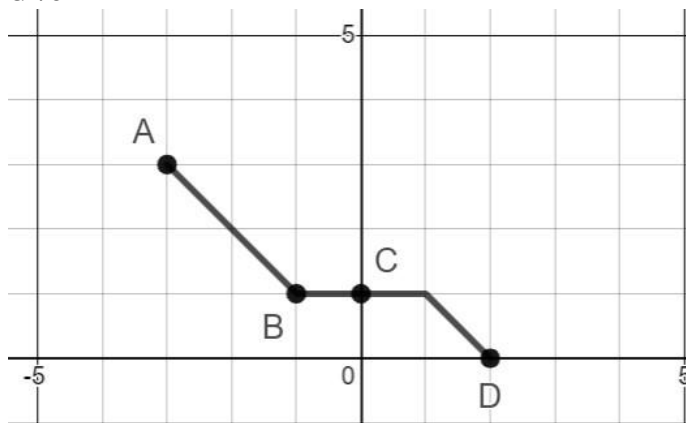
c. *Profit* $= P(x) = R(x) - C(x) = 2x - 0.5x - 120 = 1.5x - 120$
 $P(50) = 1.5(50) - 120 = -\45.00
 Given break-even is at 80 cups, there is no profit at 50 cups, only *loss* of \$45.00

d. $P(128) = 1.5(128) - 120 = \72.00

e.

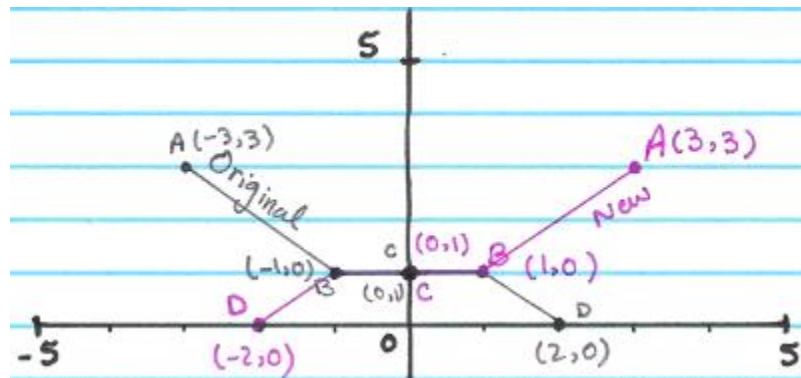


4. Given:



	$A(-3,3)$	$B(-1,1)$	$C(0,1)$	$D(2,0)$
a. $y = f(x+2)$	$A(-5,3)$	$B(-3,1)$	$C(-2,1)$	$C(0,0)$
b. $y = 3f(x)$	$A(-3,9)$	$B(-1,3)$	$C(0,3)$	$D(2,0)$
c. $y = -3f(x+2)$	$A(-5,-9)$	$B(-3,-3)$	$C(-2,-3)$	$C(0,0)$
d. $y = -3f(x+2) - 2$	$A(-5,-11)$	$B(-3,-5)$	$C(-2,-5)$	$C(0,-2)$

e.



5. $S(p) = 50p - 800 \cdot D(p) = -10p + 2950$

- a. What is the equilibrium price per watch and what is the equilibrium quantity demanded? Show work.

$$\text{To find } D(p) \rightarrow 50p - 800D(p) = -10p + 2950 \Rightarrow D(p) = \frac{60p - 2950}{800}$$

$$D(p) = 0.075p - 3.6875$$

$$\text{at Equilibrium, we have } S(p) = D(p)$$

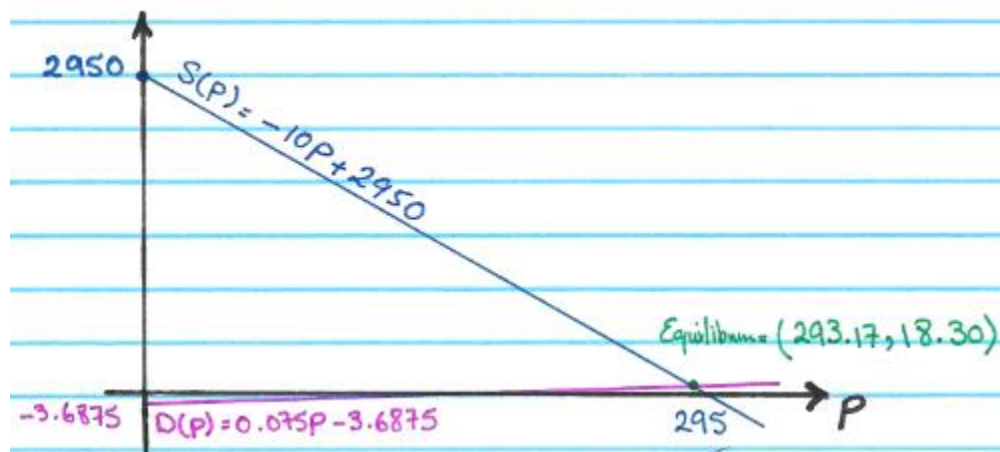
$$\rightarrow -10p + 2950 = \frac{60p - 2950}{800} \Rightarrow 800(-10p + 2950) = 60p - 2950$$

$$\rightarrow -8000p + 2360000 = 60p - 2950 \Rightarrow 8060p = 2362950 \Rightarrow$$

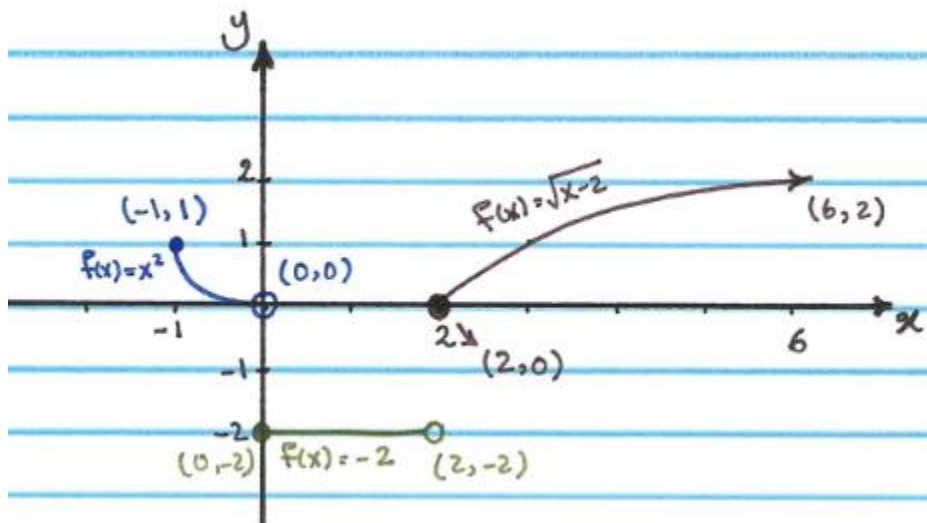
$$p = \frac{2362950}{8060} \cong \$293.17$$

$$D(293.17) = \frac{60(293.17) - 2950}{800} \cong 18.30 \cong 18$$

b.



6.
$$f(x) = \begin{cases} x^2; & -1 \leq x < 0 \\ -2; & 0 \leq x < 2 \\ \sqrt{x-2}; & x \geq 2 \end{cases}$$



i) $D = [-1, \infty)$

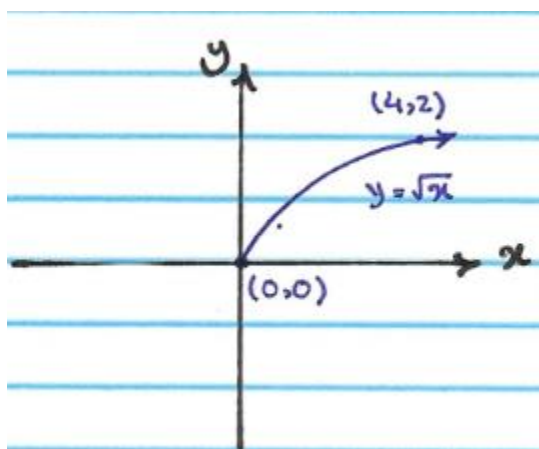
ii) $R = \{-2\} \cup [0, \infty)$

iii)
$$\begin{cases} \text{local min: None} \\ \text{local max: } (-1, 1) \\ \text{abs. min: None} \\ \text{abs. Max: None} \end{cases}$$

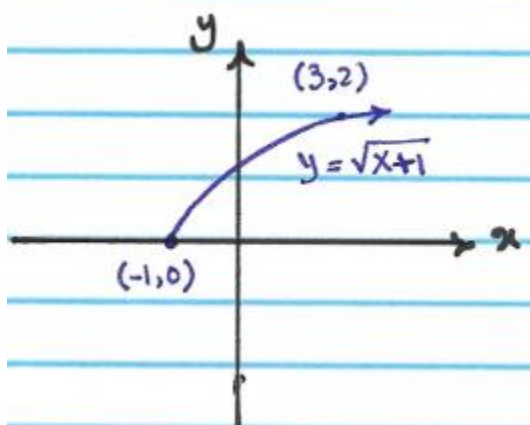
$$\text{iv) } \begin{cases} \text{Increasing: } (2, \infty) \\ \text{Decreasing: } (-1, 0) \\ \text{Constant: } (0, 2) \end{cases}$$

7. Starting from the an original function $y = f(x)$ below, sketch the graph of $f(x) = -2\sqrt{x+1} - 3$.

- a) Graph of $y = \sqrt{x}$
 Vertex = None
 Point = $(0,0), (4,2)$



- b) Graph of $y = \sqrt{x+1}$
 Transformation: shift one unit to left
 Vertex = None
 Point = $(-1,0), (3,2)$

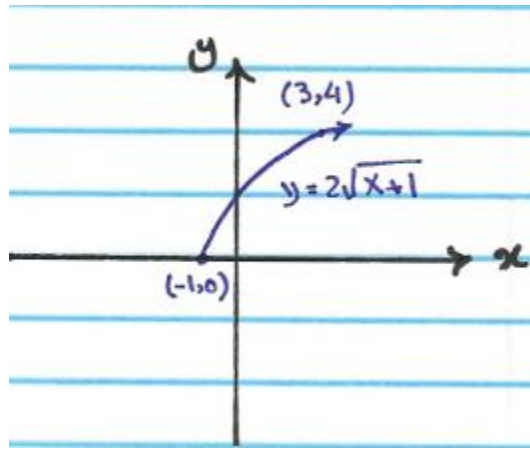


c) Graph of $y = 2\sqrt{x+1}$

Transformation: Vertical Stretch by a factor of 2

Vertex = None

Point = $(-1,0), (3,4)$

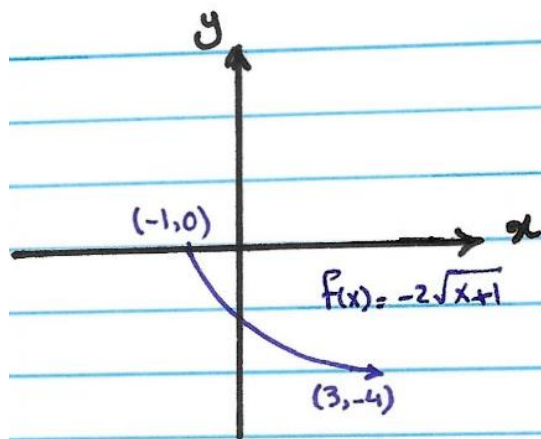


d) graph of $y = -2\sqrt{x+1}$

Transformation: Reflect against the x - axis

Vertex = None

Point = $(-1,0), (3,-4)$



e) graph of $y = -2\sqrt{x+1} - 3$

Transformation: shift three units down

Vertex = None

Point = $(-1, -3), (3, -7)$

