

Problem four

Question one

Area of dog pen=4000ft

$$XY=4000$$

$$Y = (4000/x) \text{ ft.}$$

Corner post cost=\$8.50 each

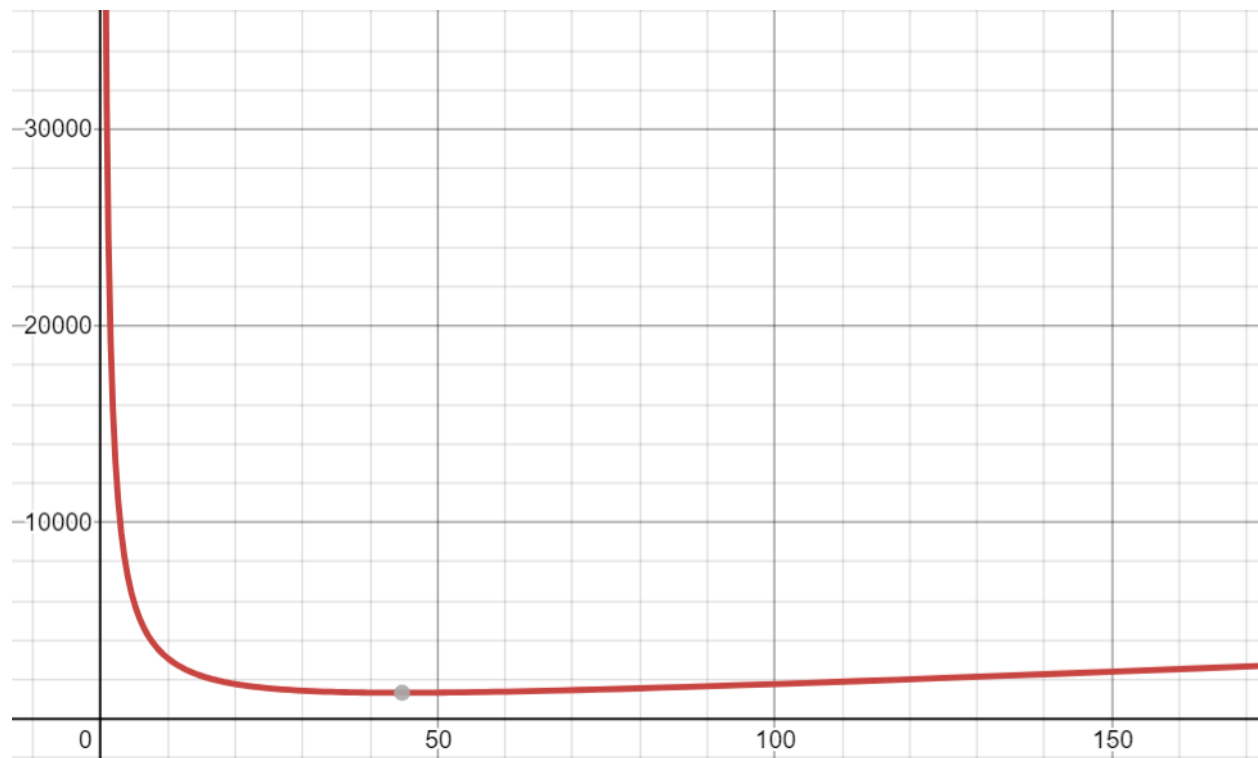
Fencing cost=\$7.25 per foot

a. Total cost = $C(X) = 4 \cdot 8.50 + (x+x+400/x) (7.25),$

$$34 + (2x+400/x) (7.25)$$

$$C(x) = 34 + 14.5 + 29000/x$$

b. Graph



Dimensions for least cost: $x=44.72$ ft

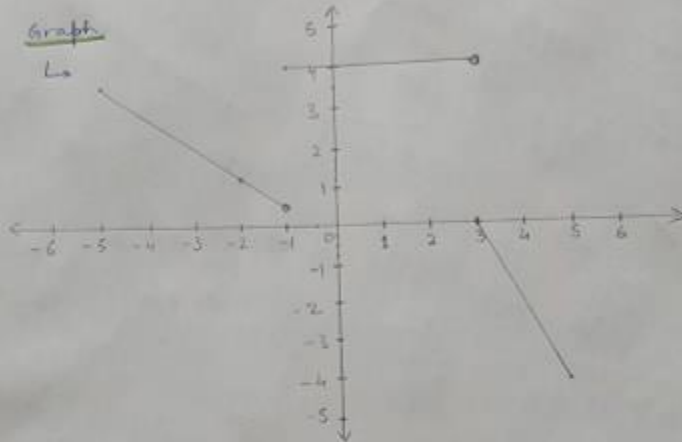
$$Y=89.44 \text{ ft.}$$

c. Total cost of pen = $C(44.72) = \$1330.92$

Question Two.

$$f(x) = \begin{cases} -0.75x - 0.25 & , -5 \leq x < -1 \\ 4 & , -1 \leq x < 3 \\ -2x + 6 & , 3 \leq x \leq 5 \end{cases}$$

(a) Graph
L_a



(b) Domain of 'f' = $[-5, 5]$

(c) Range of f = $\left(\frac{1}{2}, \frac{7}{2}\right] \cup \{4\} \cup [-4, 0]$
= $[-4, 0] \cup \left(\frac{1}{2}, \frac{7}{2}\right] \cup \{4\}$

(d) On the interval $[-5, -1]$ and $[3, 5]$, the function 'f' is decreasing.