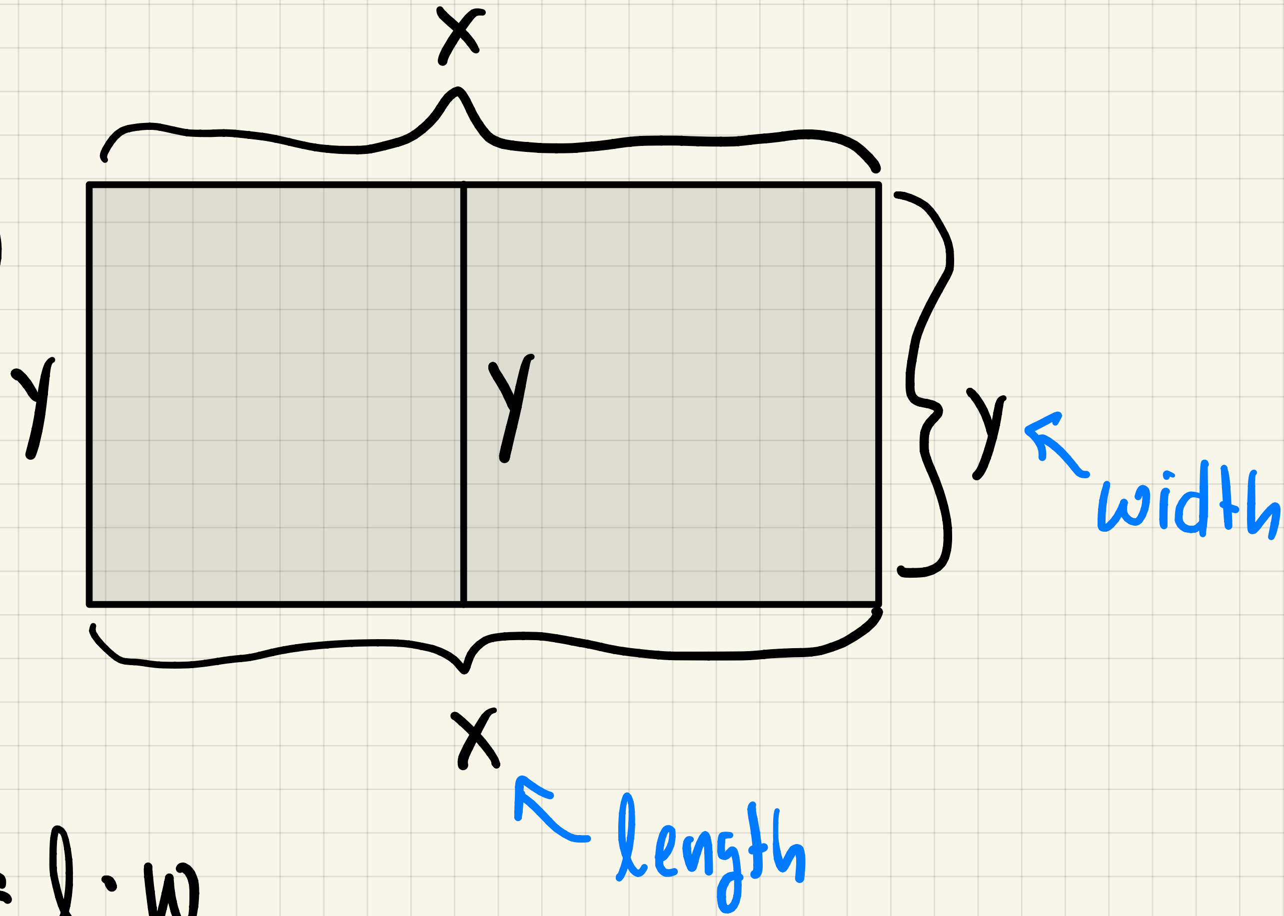
25



$A = l \cdot w$

1000 ft of fence $\rightarrow$ $2x + 3y = 1000$

$A(x) = (x)(y)$

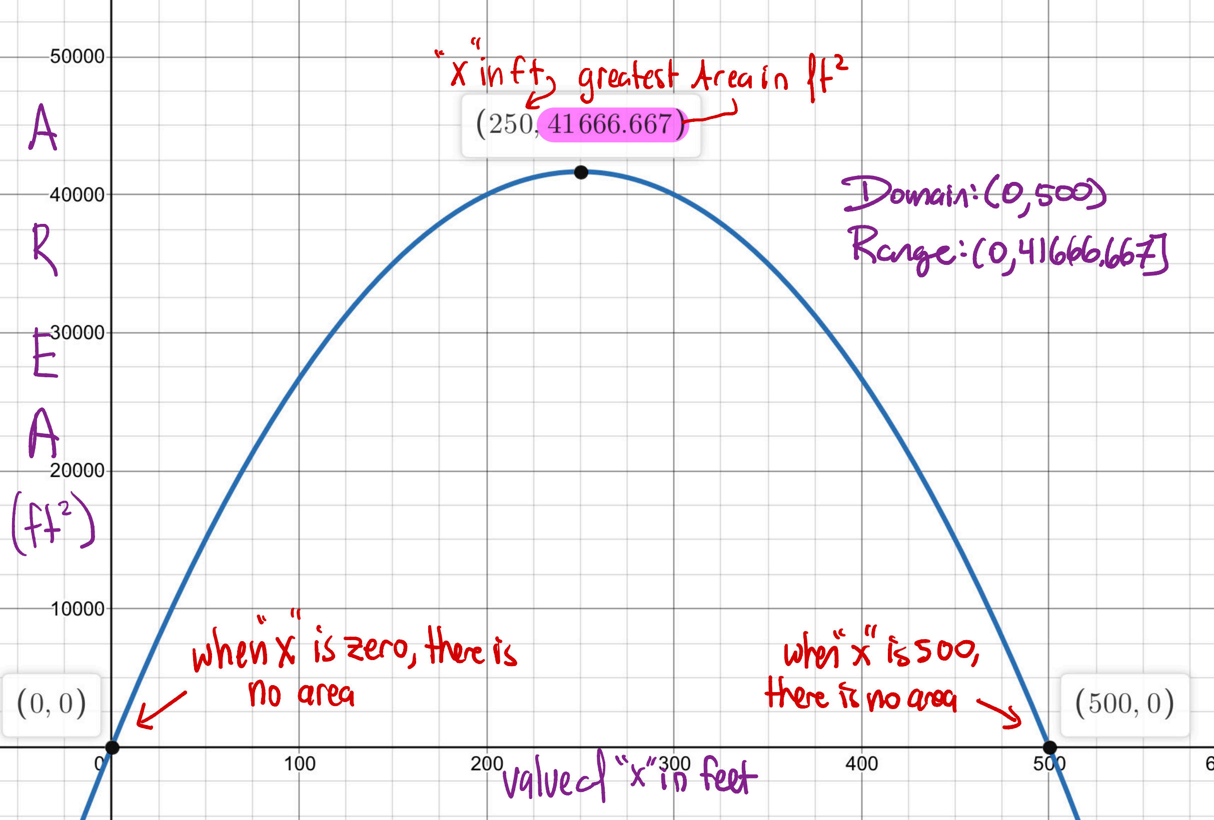
$$\boxed{A(x) = (x)\left(\frac{1000-2x}{3}\right)}$$

$2x + 3y = 1000$

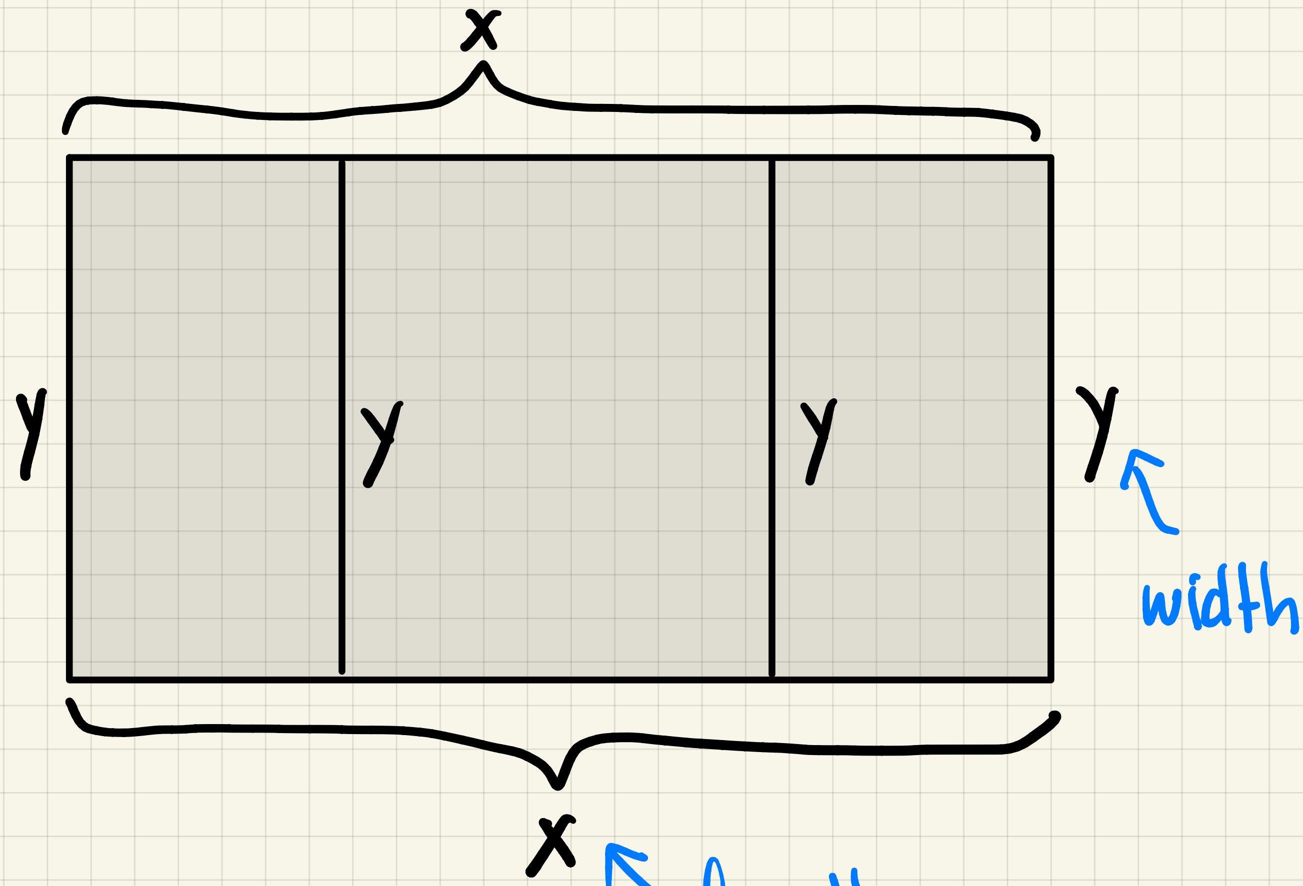
$3y = 1000 - 2x$

$y = \frac{1000-2x}{3}$

Graph results next page....


50000
40000
30000
20000
10000
0
100
200
300
400
500
AREA
(ft²)
(250, 41666.667)
"x" in ft, greatest Area in ft²
Domain: (0, 500)
Range: (0, 41666.667]
(0, 0)
when "x" is zero, there is no area
when "x" is 500, there is no area
(500, 0)
valued "x" in feet

26



$A = \ell \cdot w$

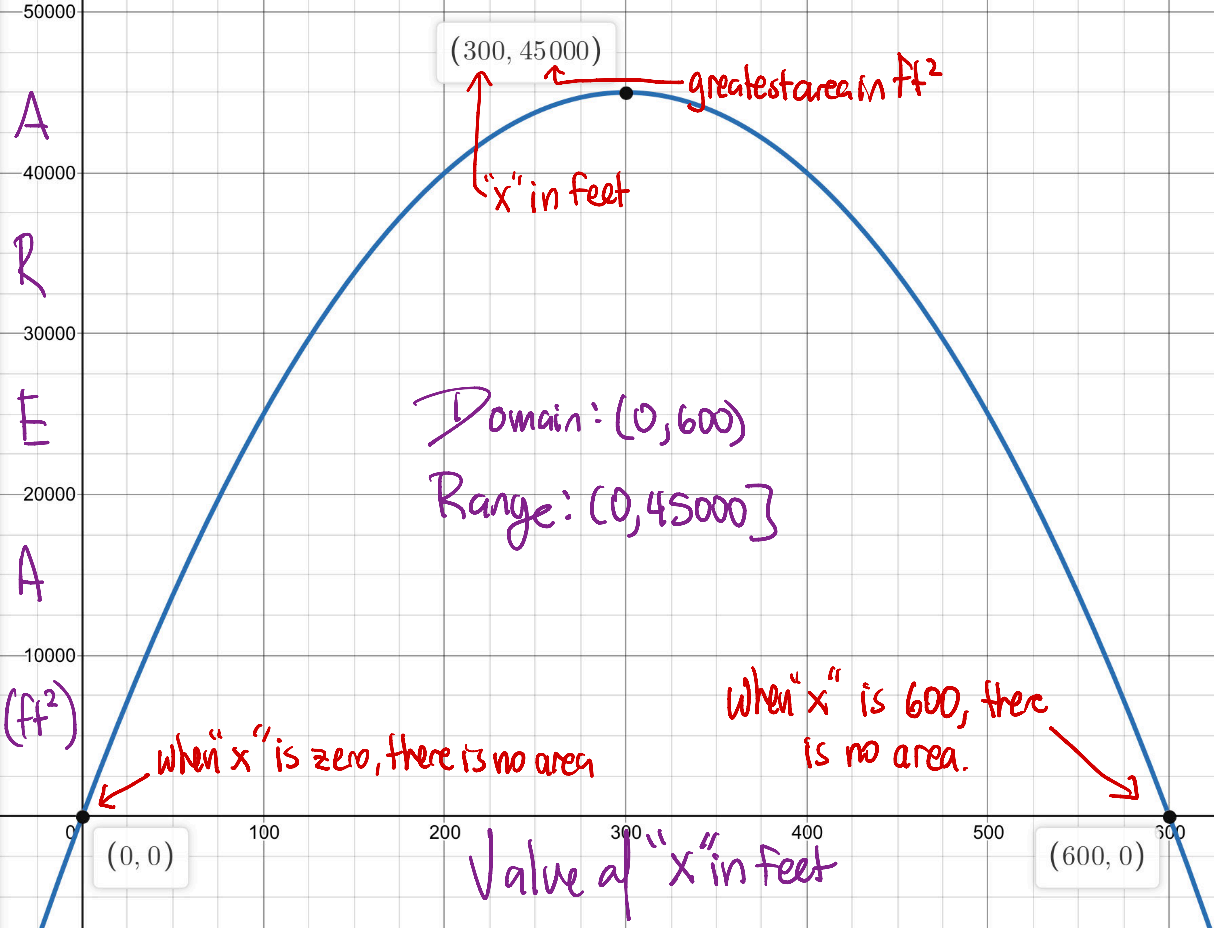
1200 ft of fence $\rightarrow 2x + 4y = 1200$

$A = (x)(y)$

$$\boxed{A(x) = (x)\left(\frac{1200-2x}{4}\right)}$$

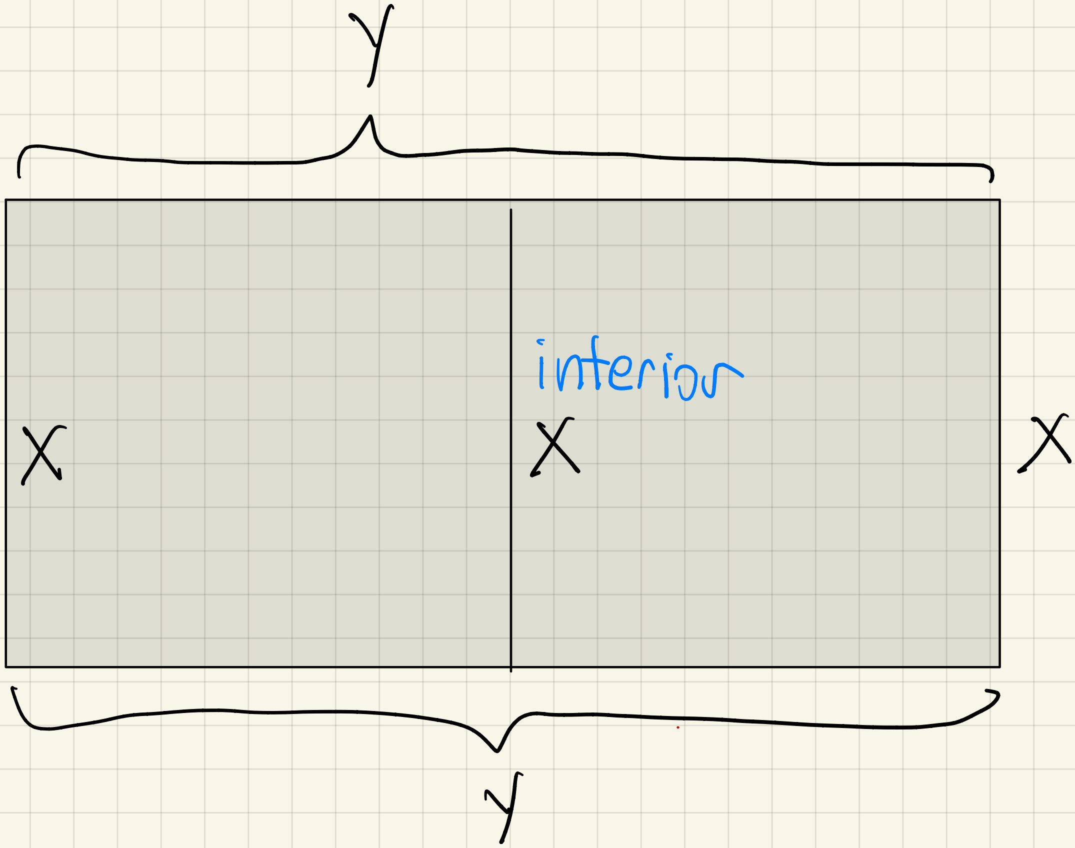
$$2x + 4y = 1200$$
$$4y = 1200 - 2x$$
$$y = \frac{1200-2x}{4}$$

Graph results next page....



50000
40000
30000
20000
10000
0
100
200
300
400
500
600
(300, 45000)
greatest area in ft²
"x" in feet
A R E A (ft²)
Domain: [0,600)
Range: (0,45000]
when "x" is 600, there is no area.
when "x" is zero, there is no area
(0, 0)
(600, 0)
Value of "x" in feet

29



interior wall → \$125 per foot

exterior wall → \$175 per foot

Shaded area is 4000 ft^2

$A = l \cdot w$

$x \cdot y = 4000$

$y = \frac{4000}{x}$

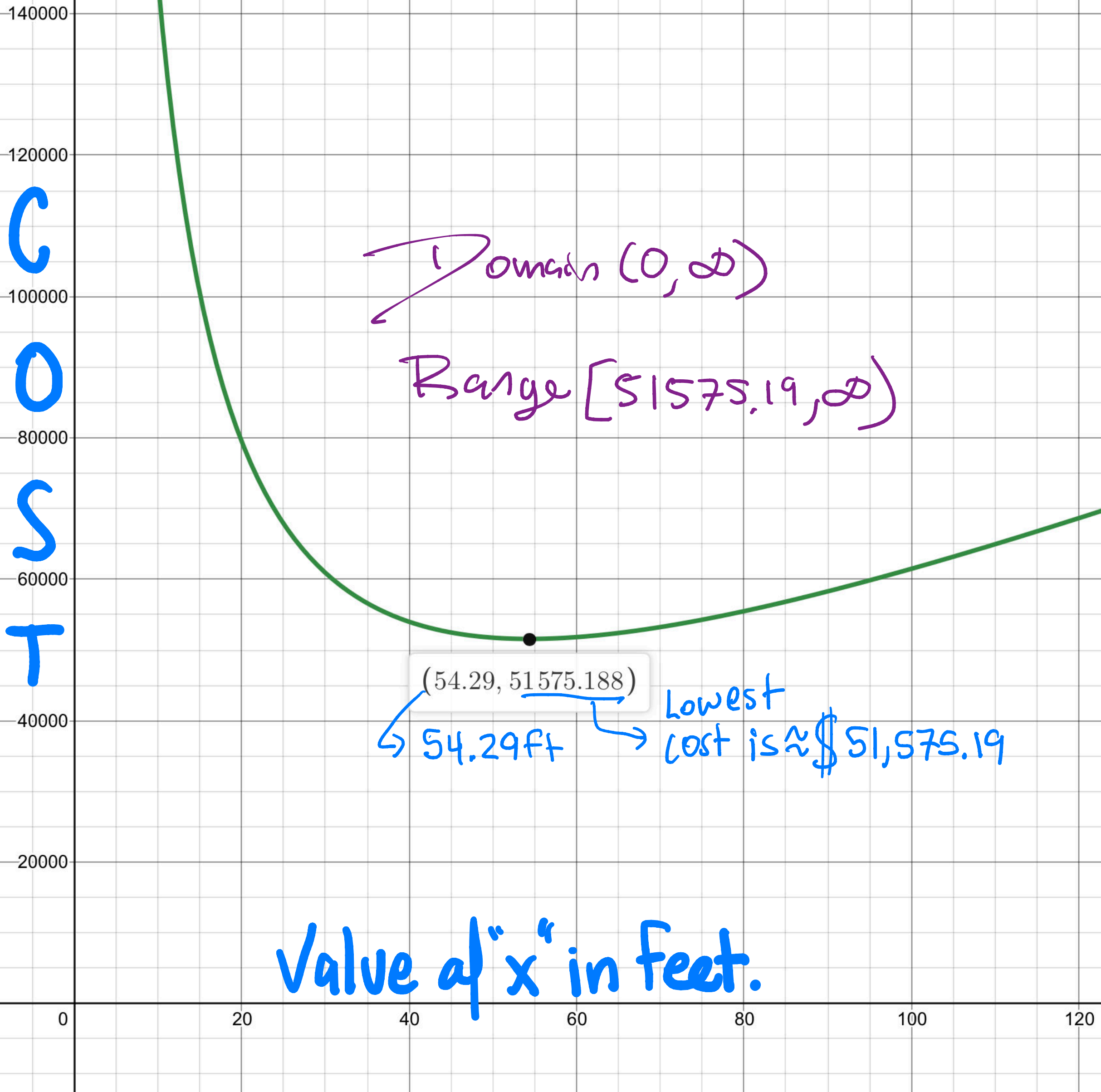
$cost = 175(2y) + 175(2x) + 125x$

$Cost = 350y + 350x + 125x$

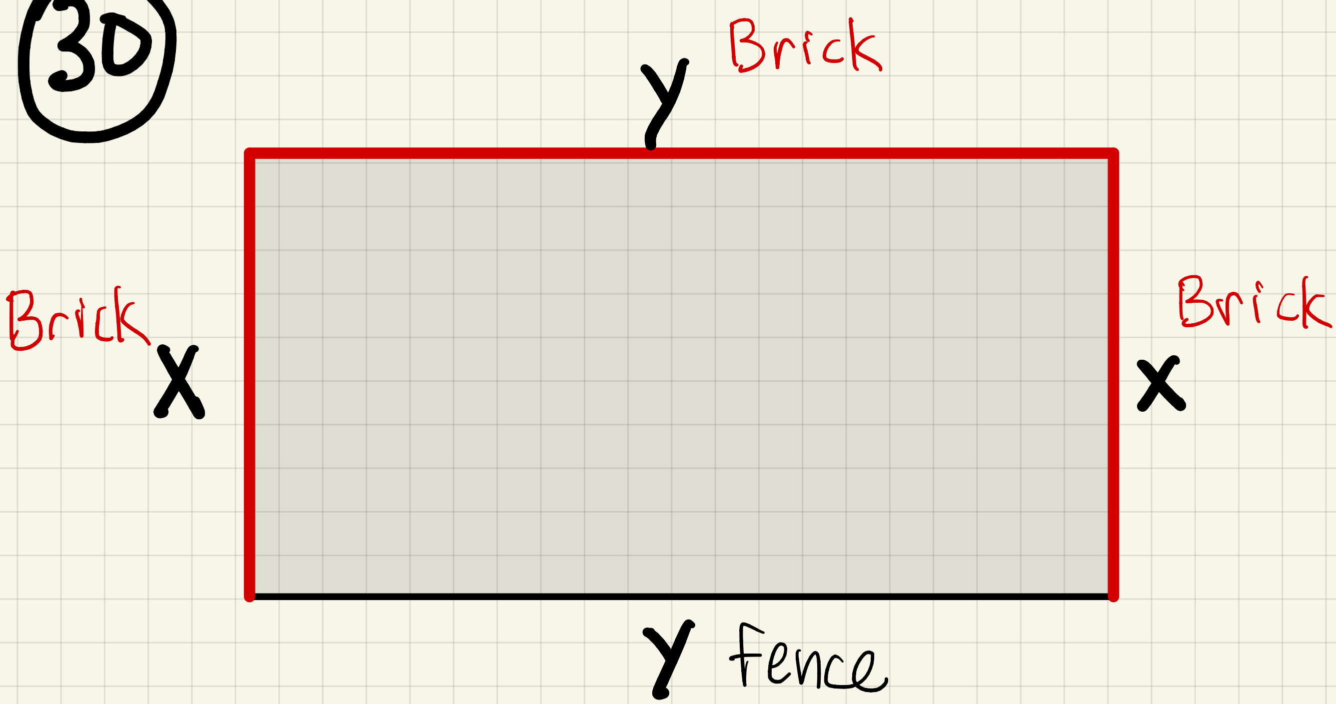
$C(x) = 350y + 475x$

$$\boxed{C(x) = 350\left(\frac{4000}{x}\right) + 475x}$$

Graph results next page....


COST
140000
120000
100000
80000
60000
40000
20000
0
20
40
60
80
100
120
Domain (0, ∞)
Range [51575.19, ∞)
(54.29, 51575.188)
54.29ft
Lowest cost is ≈ $51,575.19
Value of "x" in Feet.

30



Brick wall → \$20 ft

Fence → \$9 ft

shaded area is $125\ ft^2$

$A = l \cdot w$

$125 = x \cdot y$

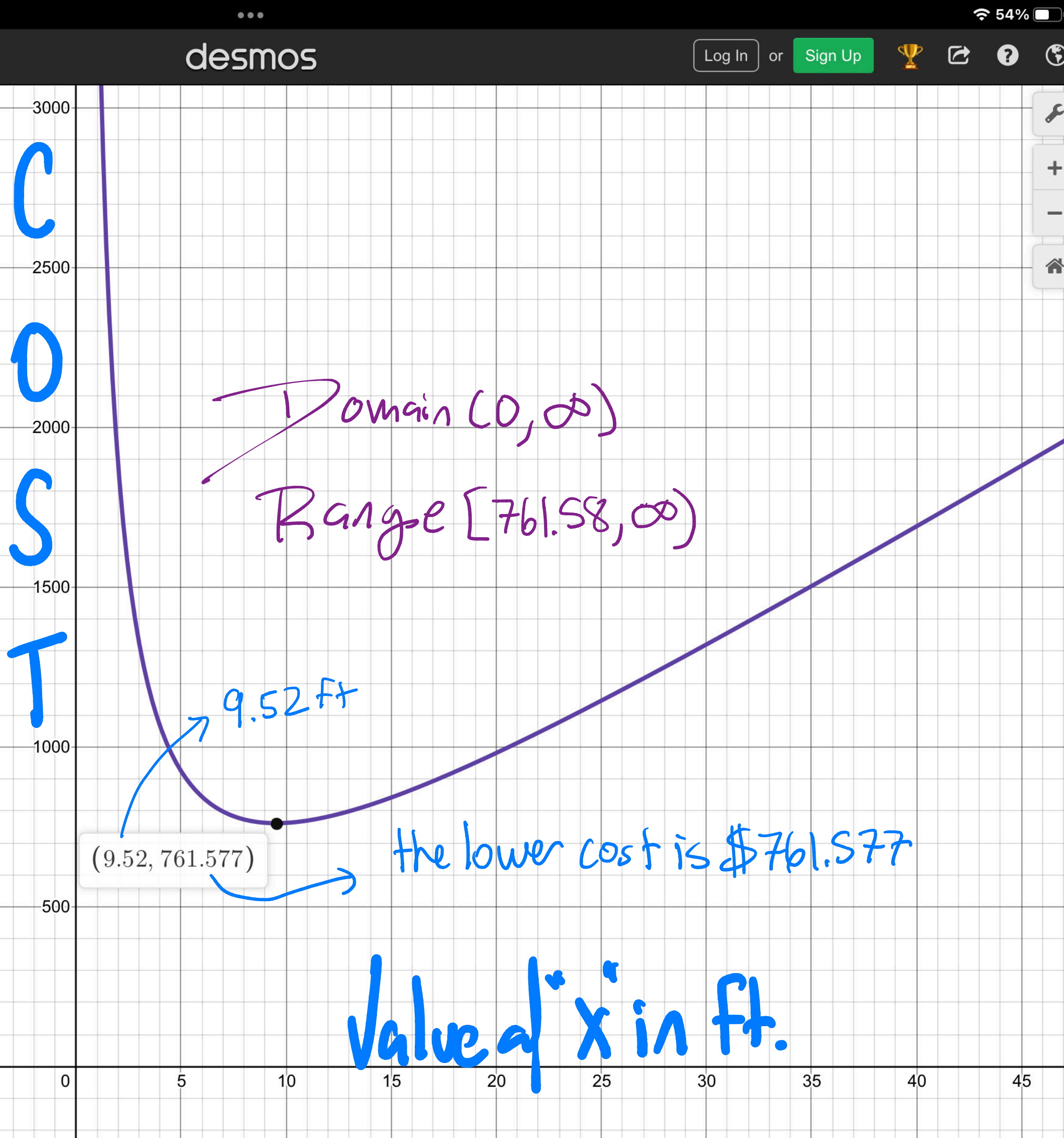
$y = \dfrac{125}{x}$

$\text{Cost} = 20(2x) + 20y + 9y$

$C(x) = 40x + 29y$

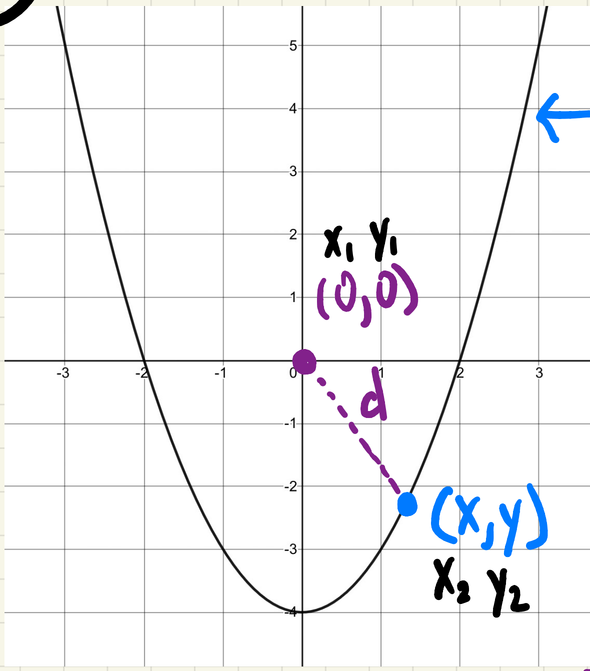
$$\boxed{C(x) = 40x + 29\left(\frac{125}{x}\right)}$$

Graph results next page....



54%
desmos
Log In
or
Sign Up
COST
3000
2500
2000
1500
1000
500
0
5
10
15
20
25
30
35
40
45
Domain (0, ∞)
Range [761.58, ∞)
9.52 ft
(9.52, 761.577)
the lower cost is $761.577
Value of "x" in ft.

35



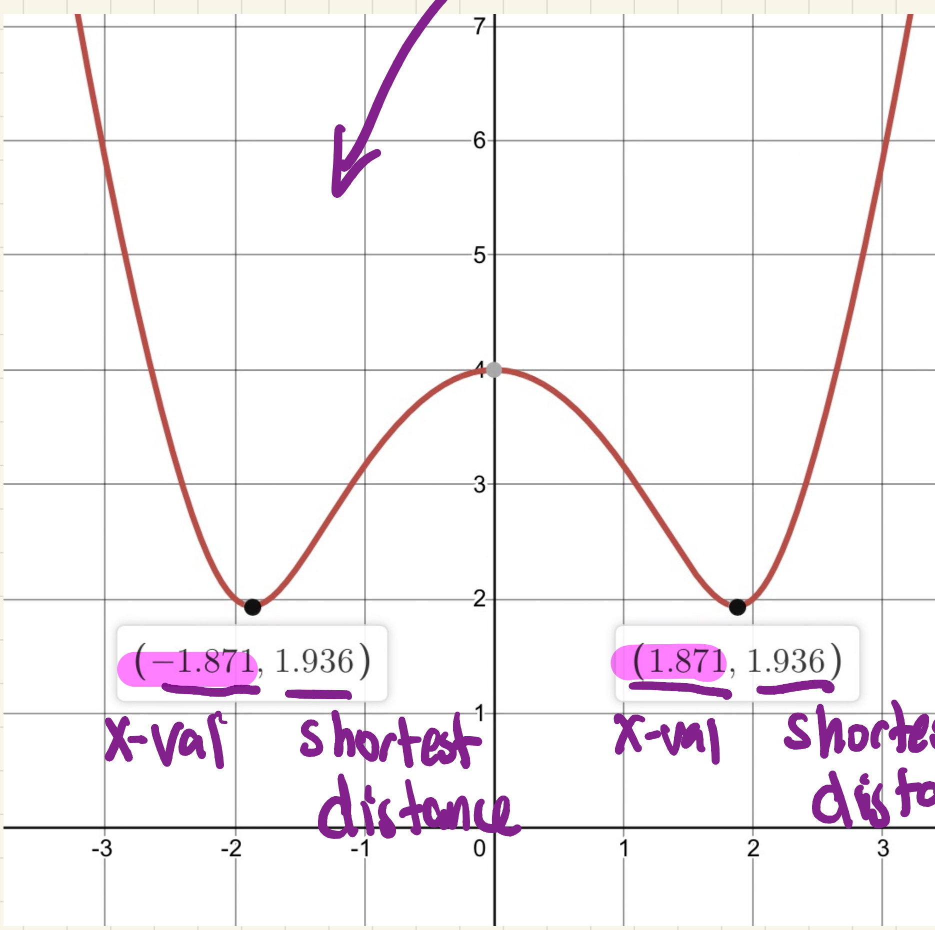
$\leftarrow y = x^2 - 4$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$d = \sqrt{(x-0)^2 + (y-0)^2}$$

$$d(x) = \sqrt{(x-0)^2 + ((x^2-4)-0)^2}$$

$$\boxed{d(x) = \sqrt{(x)^2 + (x^2-4)^2}}$$

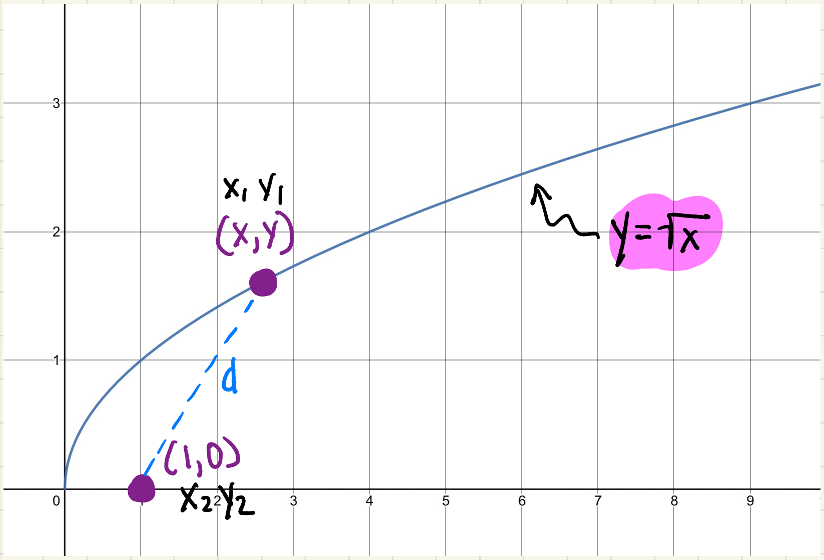


* Note there are two x-values that result in the shortest distance.

Domain $(-\infty, \infty)$

Range $[1.94, \infty)$

37

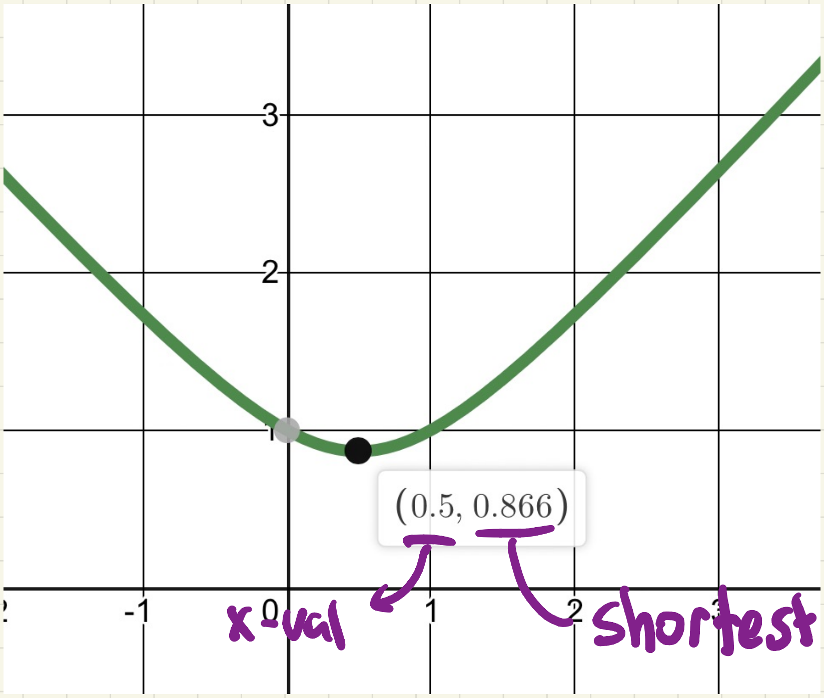


$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$d = \sqrt{(1 - x)^2 + (0 - y)^2}$$

$$d(x) = \sqrt{(1 - x)^2 + (0 - \sqrt{x})^2}$$

$$\boxed{d(x) = \sqrt{(1 - x)^2 + x}}$$



Domain $(0, \infty)$

Range $[0.87, \infty)$