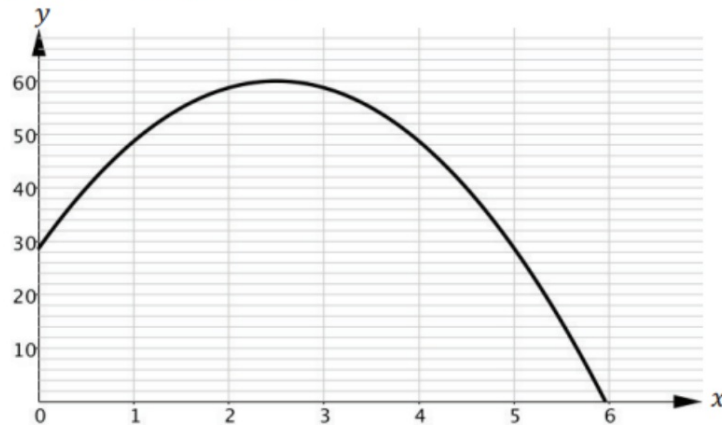


Bellwork: Algebra 1

1. Happy Tuesday!!
2. Please have a calculator and Algebra Nation book.
3. Answer the following question on your TUESDAY Bellwork:

Write a short "real world" story about this graph using the key features of a graph of a quadratic equation.



CAN YOU DO MATH IN THE REAL WORLD?

yes I
can!

① You are thinking about opening your own business. The price p (in dollars) and the quantity x sold of a certain product obey the demand equation:

$$p = -\frac{1}{5}x + 200$$

A) Write a function that expresses the revenue R as a function of x and graph. ($R = xp$).

$R(x) = -\frac{1}{5}x^2 + 200x$

B) What is the domain of R ?

$0 \leq x \leq 1000$

C) What is the revenue if 300 units are sold?

$\approx 40,000$

D) What quantity x maximizes revenue?

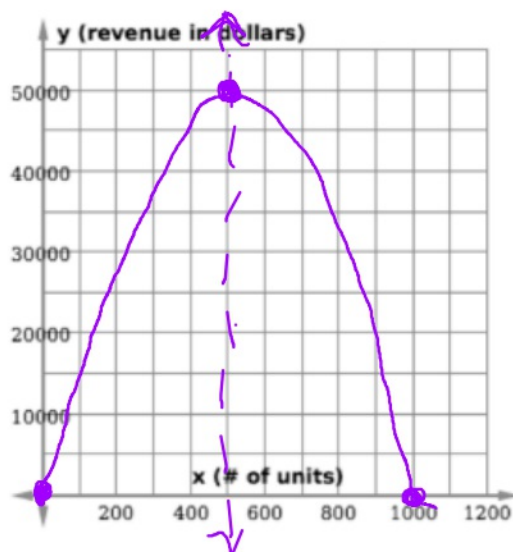
500

E) What is the maximum revenue?

$\$50,000$

~~*~~ What price should the company charge to maximize revenue?

$(500, 50,000)$



$$x = \frac{-b}{2a} = \frac{-200}{2(-\frac{1}{5})} = \frac{-200}{-\frac{2}{5}} = 500$$

$$R(x) = -\frac{1}{5}(500)^2 + 200(500)$$

$$-\frac{1}{5}(250,000) + 100,000$$

$$-50,000 + 100,000 = 50,000$$

② You also need to look at the cost of building your product. The cost C , in dollars, of building x units per day is given by the equation: $C(x) = 0.4x^2 - 20x + 400$

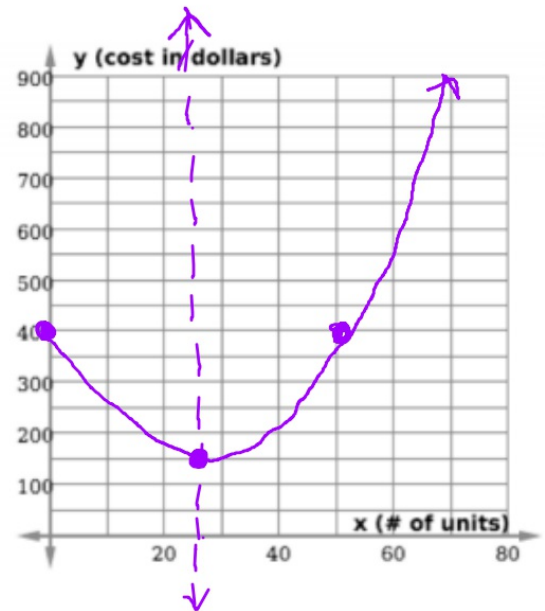
A) Graph the function.

B) How many units should your company manufacture to minimize C ?

25

C) Find the cost of building 45 units.

~ 300 - 350



$$x = \frac{-b}{2a} = \frac{+20}{2(0.4)} = \frac{20}{0.8} = 25$$

(25, 150)

$$\begin{aligned} C(x) &= 0.4(25)^2 - 20(25) + 400 \\ &= 0.4(625) - 500 + 400 \\ &= 250 - 500 + 400 = 150 \end{aligned}$$