

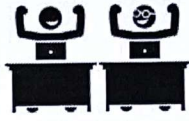
Name: **Answers!** Class: \_\_\_\_\_



Communication



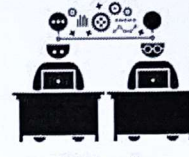
Successful Partnership



Encouragement



Solving Problem Together



Collaboration

Use Desmos!

Question 01

A company is launching a new shoe line. It is considering a price between \$60 and \$200. It does some market research and finds that for each additional dollar the shoe costs, the company can expect to sell 200 less shoes. The company models the expected demand with the linear function  $d(x) = 50000 - 200x$  where  $d(x)$  is the demand and  $x$  is the price.



Write a quadratic function to model the expected revenue where  $r(x)$  is the revenue and  $x$  is the price in dollars.

$$r(x) = (50000 - 200x)x$$

At what price should the company sell the shoe?

**\$125**

$$r(x) = -200(-250 + x)(x)$$

How much revenue should the company expect?

**\$3,125,000**

$$r(x) = -200(x - 250)(x + 0)$$

How many shoes should the company produce?

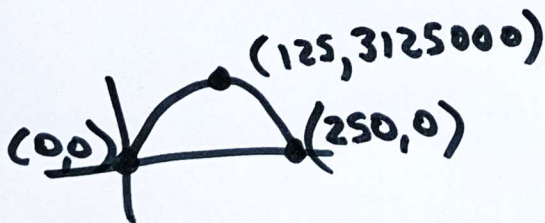
**25,000**

vertex at  $x = 125$

$$r(x) = -200(125 - 250)(125 + 0)$$

$$r(x) = -200(-125)(125)$$

$$r(x) = 3,125,000$$



$$d(x) = 50000 - 200(125)$$

$$d(x) = 50000 - 25000$$

$$d(x) = 25000$$

Question 02

A company is launching a new hat line. It is considering a price between \$10 and \$30. It does some market research and finds that for each additional dollar the hat costs, the company can expect to sell 500 less hats. The company models the expected demand with the linear function  $d(x) = 75000 - 500x$  where  $d(x)$  is the demand and  $x$  is the price.



Write a quadratic function to model the expected revenue where  $r(x)$  is the revenue and  $x$  is the price in dollars.

$$r(x) = (75000 - 500x)x$$

$$r(x) = -500(-150 + x)x$$

$$r(x) = -500(x - 150)(x + 0)$$

At what price should the company sell the hat?

\$75

vertex at  $x = 75$

How much revenue should the company expect?

\$2,812,500

$$r(x) = -500(75 - 150)(75 + 0)$$

$$r(x) = -500(-75)(75)$$

$$r(x) = 2,812,500$$

How many hats should the company produce?

37,500

$$d(x) = 75000 - 500(75)$$

$$d(x) = 37,500$$

Question 03

A company is launching a new bike line. It is considering a price between \$500 and \$1000. It does some market research and finds that for each additional dollar the bike costs, the company can expect to sell 25 less bikes. The company models the expected demand with the linear function  $d(x) = 40000 - 25x$  where  $d(x)$  is the demand and  $x$  is the price.



Write a quadratic function to model the expected revenue where  $r(x)$  is the revenue and  $x$  is the price in dollars.

$$r(x) = (40000 - 25x)x$$

$$r(x) = -25(-1600 + x)x$$

$$r(x) = -25(x - 1600)(x + 0)$$

At what price should the company sell the bike?

\$800

vertex at 800

How much revenue should the company expect?

\$16,000,000

$$r(x) = -25(800 - 1600)(800 + 0)$$

$$r(x) = 16,000,000$$

How many bikes should the company produce?

20,000

$$d(x) = 40000 - 25(800)$$

$$d(x) = 20,000$$