

Today's Learning Goal(s):

Date: _____

By the end of the class, I will be able to:

- a) determine the equation of the inverse of a quadratic function.

Last day's Assigned Practice:

pp. 153-154 #3, 4ace, 5ac, 7ac, 8, 11

p. 153

5. Each function is the demand function of some item, where x is the number of items sold, in thousands. Determine

- i) the revenue function
ii) the maximum revenue in thousands of dollars

- | | |
|----------------------|-------------------------|
| a) $p(x) = -x + 5$ | c) $p(x) = -0.6x + 15$ |
| b) $p(x) = -4x + 12$ | d) $p(x) = -1.2x + 4.8$ |

Today's Learning Goal(s):

By the end of the class, I will be able to:

- a) determine the equation of the inverse of a quadratic function.

3.3 The Inverse of a Quadratic Function

Date: Mar. 6/20

Recall: The inverse of a function undoes a function.

To find the equation, switch the x and y variables and rearrange for y .

For a function with coordinates (x, y) , the inverse will have coordinates (y, x) .

Ex. 1:

- a) Graph $f(x) = 2(x - 2)^2 - 4$ and its inverse.

- b) Is the inverse a function?

NO! For many x -values there is more than one y -value

(It fails the V.L.T.)

- c) Determine the equation of the inverse.

$$y = 2(x - 2)^2 - 4$$

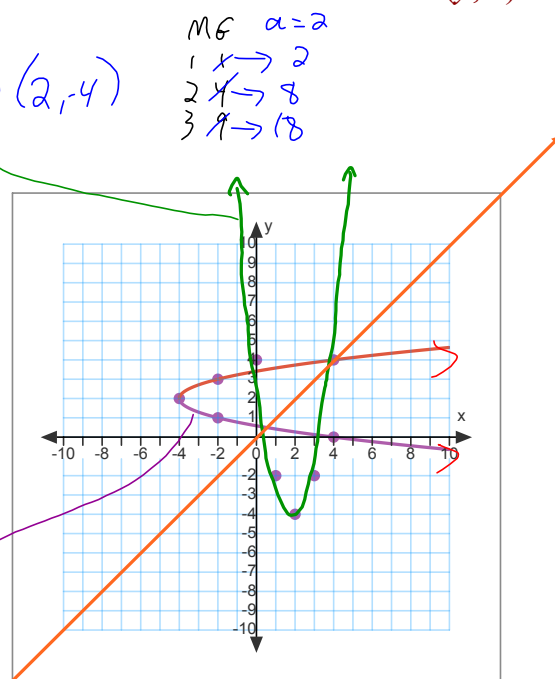
$$x = 2(y - 2)^2 - 4$$

$$x + 4 = 2(y - 2)^2$$

$$\frac{x + 4}{2} = (y - 2)^2$$

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

$$\pm \sqrt{\frac{x + 4}{2}} + 2 = y$$



$$y = x$$

$$y = 2(x - 2)^2 - 4$$

$$y = 2 + \sqrt{\frac{x + 4}{2}}$$

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

You MAY NOT use function NOTATION when something is NOT a function.

- d) Determine the Domain and Range of $f(x)$ and the inverse.

Original

$$D: \{x \in \mathbb{R}\}$$

$$R: \{y \in \mathbb{R} \mid y \geq -4\}$$

Inverse

$$\{x \in \mathbb{R} \mid x \geq -4\}$$

$$\{y \in \mathbb{R}\}$$

Are there any questions from last day's assigned work you would like to see on the board?

Last day's Assigned Pracce: pp. 153-154 #3, 4ace, 5ac, 7ac, 8, 11

Today's Assigned Practice includes:

pp. 160-162 #1 – 5, 7, 9, 13 [17]

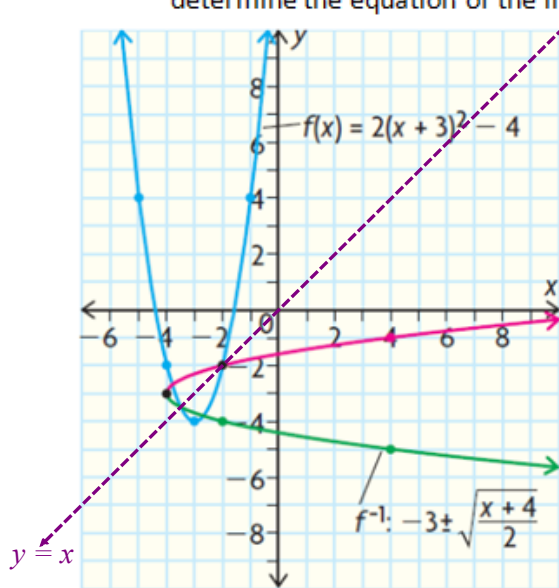
An additional example follows...

p.157 Ex.2

3.3 The Inverse of a Quadratic Function

Recall: The inverse of a function undoes a function. To find the equation, switch the x - and y -variables and rearrange for y . For a function with coordinates (x, y) , the inverse will have coordinates (y, x) .

Eg. 1) Given the quadratic function $f(x) = 2(x + 3)^2 - 4$, graph $f(x)$ and its inverse. Also determine the equation of the inverse.



$$f(x) = 2(x + 3)^2 - 4 \quad \leftarrow$$

$$y = 2(x + 3)^2 - 4$$

$$x = 2(y + 3)^2 - 4$$

$$x + 4 = 2(y + 3)^2$$

$$\frac{x + 4}{2} = (y + 3)^2$$

$$\pm \sqrt{\frac{x + 4}{2}} = y + 3$$

$$-3 \pm \sqrt{\frac{x + 4}{2}} = y$$