3.3 The Inverse of a Quadratic Function

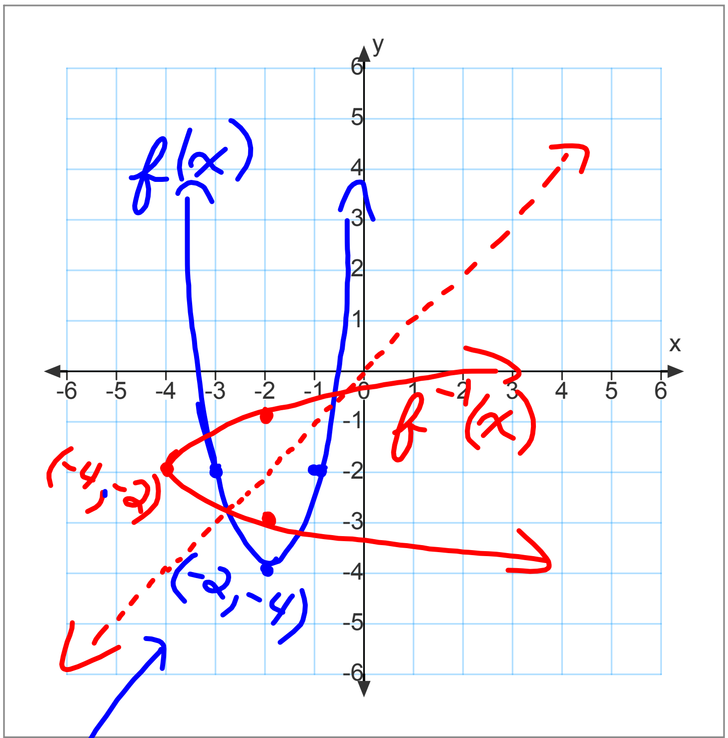
Recall: The inverse of a function undoes a function. To find the equation, switch the x and y variables and rearrange for y. For a function with coordinates (x, y), the inverse will have coordinates (y, x).

Eg. 1) Given the quadratic function:

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

a) Graph f(x) and it's inverse.

b) Determine the equation of the inverse.



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

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

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

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

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

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

$\pm\sqrt{\frac{1}{2}(x+4)} - 2 = y$

$D = \{x \in R\}$

$R = \{y \in R \mid y \geq -4\}$

* $D = \{x \in R \mid x \geq -4\}$

$R = \{y \in R\}$

Determine the Domain and range of $f(x)$ and $f^{-1}(x)$

Oct 5-7:41 PM

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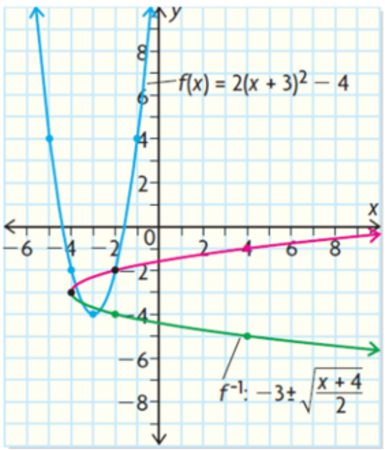
Recall: The inverse of a function undoes a function. To find the equation, switch the x- and y-variables and rearrange for y. For a function with coordinates (x, y), the inverse will have coordinates (y, x).

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



$$f(x) = 2(x + 3)^2 - 4$$
$$y = 2(x + 3)^2 - 4$$
$$x = 2(y + 3)^2 - 4$$
$$x + 4 = 2(y + 3)^2$$
$$\frac{x + 4}{2} = (y + 3)^2$$
$$\pm\sqrt{\frac{x + 4}{2}} = y + 3$$
$$-3 \pm \sqrt{\frac{x + 4}{2}} = y$$

Feb 28-10:05 PM