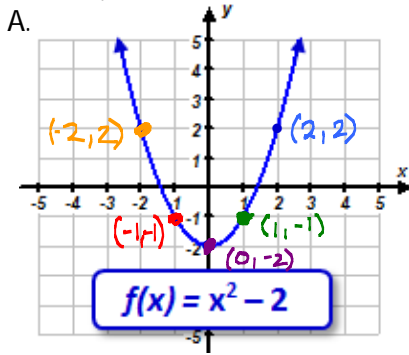
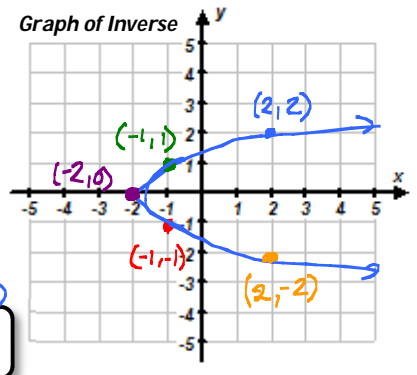


1. Consider the function  $f(x)$  shown below. Find the inverse of the function, sketch a graph of the inverse, and determine whether or not the inverse is a function.

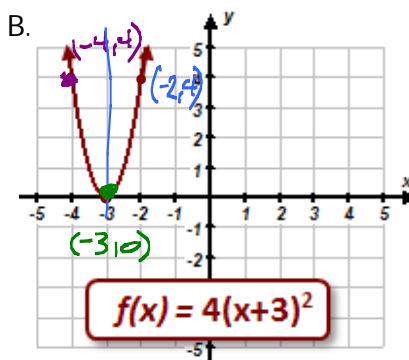


$$f(x): y = x^2 - 2$$

$$\begin{array}{l} x \leftrightarrow y \\ X = Y^2 - 2 \\ \underline{+2} \quad \underline{+2} \\ X + 2 = Y^2 \\ Y = \sqrt{X+2} \quad \leftarrow \text{WHEN } X \geq 0 \text{ FOR } f(x) \\ Y = -\sqrt{X+2} \quad \leftarrow \text{WHEN } X < 0 \text{ FOR } f(x) \end{array}$$



Is the Inverse a Function?  
YES **NO**

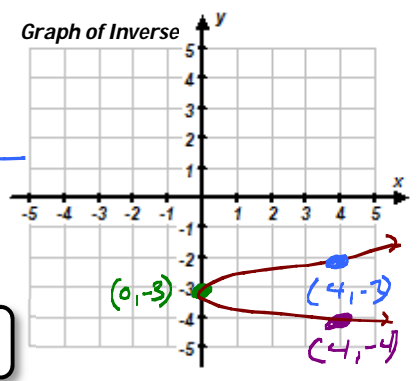


$$f(x): y = 4(x+3)^2$$

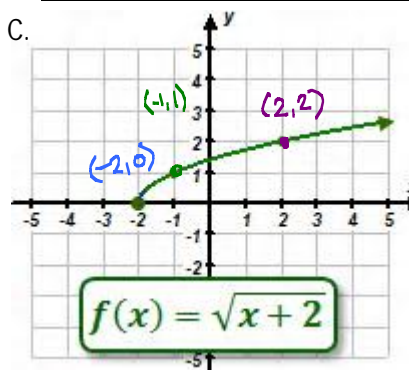
$$\begin{array}{l} x \leftrightarrow y \\ X = 4(Y+3)^2 \\ \underline{\frac{X}{4}} \quad \underline{\frac{X}{4}} \\ \frac{X}{4} = (Y+3)^2 \\ \pm \sqrt{\frac{X}{4}} = Y+3 \\ \frac{\pm \sqrt{X}}{2} = Y+3 \\ \underline{-3} \quad \underline{-3} \\ \frac{\pm \sqrt{X}}{2} - 3 = Y \end{array}$$

WHEN  $X \geq -3$  IN  $f(x)$   
THE INVERSE  $Y = \frac{\sqrt{X}}{2} - 3$

WHEN  $X < -3$  IN  $f(x)$   
THE INVERSE  $Y = \frac{-\sqrt{X}}{2} - 3$



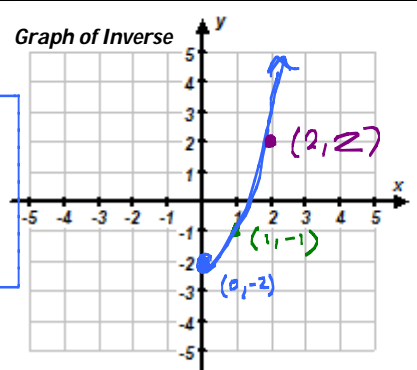
Is the Inverse a Function?  
YES **NO**



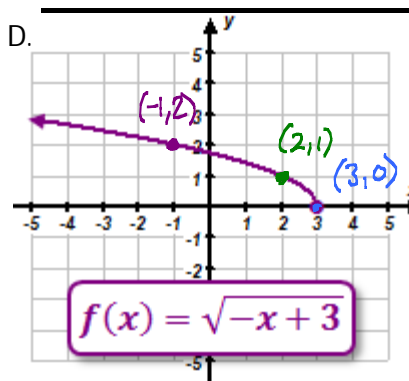
$$y = \sqrt{x+2}$$

$$\begin{array}{l} x \leftrightarrow y \\ (X)^2 = (\sqrt{Y+2})^2 \\ X^2 = Y+2 \\ \underline{-2} \quad \underline{-2} \\ X^2 - 2 = Y \end{array}$$

INVERSE  
 $f^{-1}(x) = x^2 - 2; x \geq 0$



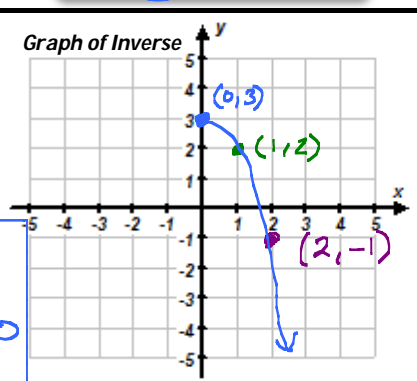
Is the Inverse a Function?  
**YES** NO



$$y = \sqrt{-x+3}$$

$$\begin{array}{l} x \leftrightarrow y \\ (X)^2 = (\sqrt{-Y+3})^2 \\ X^2 = -Y+3 \\ \underline{-3} \quad \underline{-3} \\ X^2 - 3 = -Y \\ \underline{-1} \quad \underline{-1} \\ -X^2 + 3 = Y \end{array}$$

INVERSE  
 $f^{-1}(x) = -x^2 + 3; x \geq 0$



Is the Inverse a Function?  
**YES** NO

$$X^2 - 3 = -Y$$

$$\underline{-1} \quad \underline{-1}$$

$$-X^2 + 3 = Y$$

2. Consider the function  $f(x)$  shown below. Find the inverse of the function, sketch a graph of the inverse, and determine whether or not the inverse is a function.

A.

$f(x) = \sqrt{2x+5}$

$$y = \sqrt{2x+5}$$

$$x \leftrightarrow y$$

$$(x)^2 = (\sqrt{2y+5})^2$$

$$x^2 = 2y + 5$$

$$\frac{x^2 - 5}{2} = \frac{2y}{2}$$

$$f^{-1}(x) = \frac{x^2 - 5}{2}; x \geq 0$$

Graph of Inverse

Is the Inverse a Function?  
 YES  NO

B.

$f(x) = x^3 + 2$

$$y = x^3 + 2$$

$$x \leftrightarrow y$$

$$x = y^3 + 2$$

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

$$\sqrt[3]{\frac{x-2}{-2}} = \sqrt[3]{\frac{y^3}{-2}}$$

$$f^{-1}(x) = \sqrt[3]{x-2}$$

Graph of Inverse

Is the Inverse a Function?  
 YES  NO

C.

$f(x) = \sqrt[3]{2x+3} + 1$

$$y = \sqrt[3]{2x+3} + 1$$

$$x \leftrightarrow y$$

$$x = \sqrt[3]{2y+3} + 1$$

$$\frac{x-1}{-1} = \frac{\sqrt[3]{2y+3}}{-1}$$

$$(x-1)^3 = (\sqrt[3]{2y+3})^3$$

$$(x-1)^3 = 2y+3$$

$$\frac{(x-1)^3 - 3}{2} = \frac{2y}{2}$$

$$f^{-1}(x) = \frac{(x-1)^3 - 3}{2}$$

Graph of Inverse

Is the Inverse a Function?  
 YES  NO

D.

$f(x) = \sqrt{-x^2 + 25}$

$$y = \sqrt{-x^2 + 25}$$

$$x \leftrightarrow y$$

$$(x)^2 = (\sqrt{-y^2 + 25})^2$$

$$x^2 = -y^2 + 25$$

$$\frac{x^2 - 25}{-1} = \frac{-y^2}{-1}$$

$$\pm \sqrt{-x^2 + 25} = \sqrt{y^2}$$

WHEN  $x \geq 0$  FOR  $f(x)$   
 THE INVERSE IS  
 $f^{-1}(x) = \sqrt{-x^2 + 25}; x \geq 0$

WHEN  $x < 0$  FOR  $f(x)$   
 THE INVERSE IS  
 $f^{-1}(x) = -\sqrt{-x^2 + 25}; x \geq 0$

Graph of Inverse

Is the Inverse a Function?  
 YES  NO