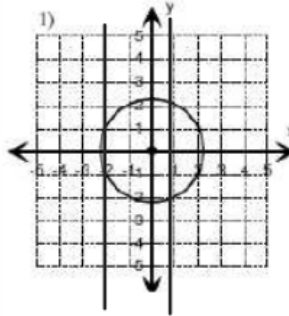


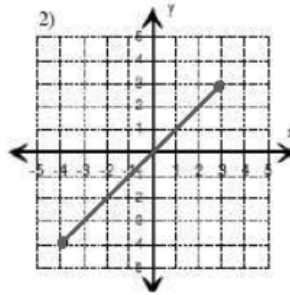
What you'll Learn About

Is the relation a function? Does the relation have an inverse? If the function has an inverse, sketch the graph of the inverse.

Inverse
Switch x and y



No Function



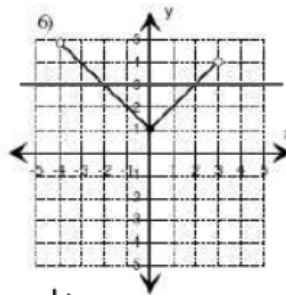
Yes Function

Yes Inverse

$$(3, 3) \rightarrow (3, 3)$$

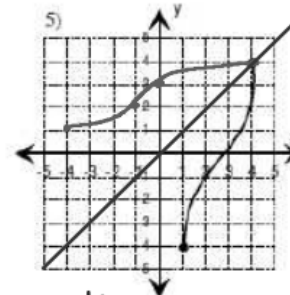
$$(2, 2) \rightarrow (2, 2)$$

$$(-4, -4) \rightarrow (-4, -4)$$



Yes Function

No Inverse



Yes Function

Yes Inverse

$$(4, 4) \rightarrow (4, 4)$$

$$(3, 0) \rightarrow (0, 3)$$

$$(2, -1) \rightarrow (-1, 2)$$

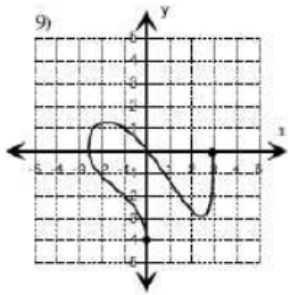
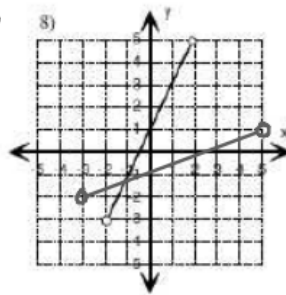
$$(1, -4) \rightarrow (-4, 1)$$

Yes Function

Yes Inverse

$$(1, 5) \rightarrow (5, 1)$$

$$(-2, -3) \rightarrow (-3, -2)$$



No Function

→ Inverse

$f^{-1}(x)$

1) Change $f(x)$ to y

2) Switch x and y

3) Solve for y

Find a formula for $f^{-1}(x)$. Give the domain of $f^{-1}(x)$, including any restrictions "inherited" from f .

A. $f(x) = 5x + 2$

$$y = 5x + 2$$

$$x = 5y + 2$$

$$x - 2 = 5y$$

$$y = \frac{x-2}{5} = \frac{1}{5}x - \frac{2}{5}$$

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

B. $f(x) = \frac{3x+2}{x-1}$

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

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

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

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

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

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

$$x^2 = y + 5$$

$$y = x^2 - 5$$

$$f^{-1}(x) = x^2 - 5$$

D. $f(x) = \sqrt{x^3 - 2}$

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

$$(x)^2 (\sqrt{y^3 - 2})^2$$

$$x^2 = y^3 - 2$$

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

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

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

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