

Find the inverse of each function.

3 steps

1)  $g(x) = -\frac{1}{x+2}$

step 1: replace  $g(x)$  with  $y$

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

step 2: switch the positions of  $x$  &  $y$

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

step 3: solve for  $y$

$$(y+2)x = \frac{-1}{y+2} \cdot (y+2)$$

mult  
(y+2) on  
both  
sides

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

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

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

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

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

subtract  
2

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

divide  
by  
(x-2)

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

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

multiply  
by x+3

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

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

5)  $f(x) = 2x + 10$

$$y = 2x + 10$$

$$x = 2y + 10$$

$$x - 10 = 2y$$

$$\frac{x-10}{2} = y$$

7)  $h(x) = -3x - 6$

$$y = -3x - 6$$

$$x = -\frac{y+6}{3}$$

$$x + 6 = -\frac{y}{3}$$

$$\frac{x+6}{-3} = y$$

4)  $f(x) = 2x + 5$

$$y = 2x + 5$$

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

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

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

6)  $g(x) = \frac{1}{-x-2} + 1$

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

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

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

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

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

$$(-y-2)(x-1) = 1$$

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

8)  $f(x) = \frac{3}{x+1}$

step 1

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

step 2

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

mult  
by y+1

$$(y+1)x = 3$$

step 3

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

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

divide  
by x

State if the given functions are inverses.

9)  $f(x) = x + 4$   
 $h(x) = x - 4$

pick 1 of the equations and find inverse.

step 1  $f(x) = x + 4$   
 $y = x + 4$   
 step 2  $x = y + 4$   
 $x - 4 = y$

NOW CHECK  
 DOES  $y = x - 4$   
 equal equation 4?

If YES they are  
 INVERSES. ✓

11)  $g(x) = 3x - 2$   
 $f(x) = 2x - 2$

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

$g$  and  $f$   
 are NOT  
 INVERSES. //

IS  $\frac{x + 2}{2} \stackrel{?}{=} g(x)$   
 NO

13)  $g(x) = 2x + 6$   
 $f(x) = -3 + \frac{1}{2}x$

$g(x) = 2x + 6$   
 $y = 2x + 6$   
 $x = 2y + 6$   
 $\frac{x - 6}{2} = 2y$   
 $\frac{x}{2} - 3 = y$

YES  
 INVERSES //

10)  $h(n) = 2n + 4$   
 $f(n) = -2 + \frac{1}{2}n$

$h(n) = 2n + 4$   
 $y = 2x + 4$   
 $x = 2y + 4$

YES  
 INVERSES //

$x - 4 = 2y$

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

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

$y = \frac{x}{2} - 2$   
 $\parallel$   
 $f(x)$

12)  $g(x) = \frac{3}{4}x + 1$

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

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

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

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

NOT  
 INVERSES //

14)  $g(n) = -n - 4$   
 $f(n) = -2n - 4$

$g(n) = -n - 4$

$y = -x - 4$

$x = -y - 4$

$x + 4 = -y$

$-x - 4 = y$

NOT INVERSES //