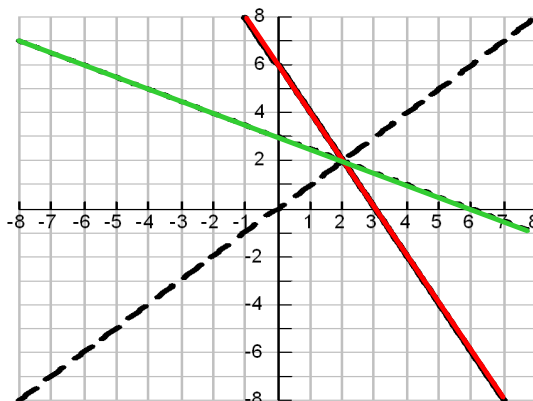## 10-4 Inverse Functions

Notation:

$$f^{-1}(x)$$

Represents the inverse of the function $f(x)$

Show $f(x) = 6 - 2x$ and $g(x) = \dfrac{6-x}{2}$

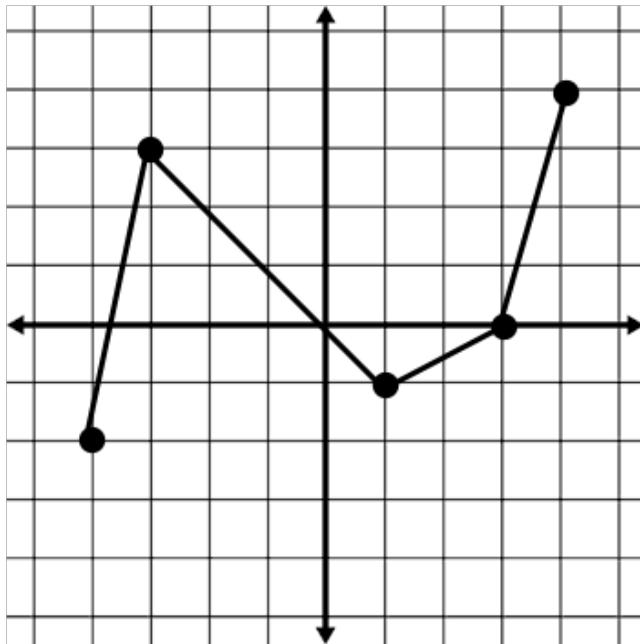are inverses graphically.

$h(x) = 3x - 2$

$g(x) = \dfrac{x}{3} + 2$

NO

f(x):   (1,4)   (3,0)   (4,-2)

g(x):   (4,1)   (0,3)   (-2,4)

Graph the inverse of the graph. (Use y=x to find inverse points)

To find the inverse equation of a function

1. Change $f(x)$ to y.

2. Switch x and y

3. Solve for y

4. Change new y to $f^{-1}(x)$

Find the inverse of each function.
Is the inverse a function?

$f(x) = 2x + 5$

$g(x) = \sqrt{x - 7}$

$y = \sqrt{x - 7}$

$x = \sqrt{y - 7}^{2}$

$x^2 = y - 7$
$+7 \qquad +7$

$x^2 + 7 = y$

$x^2 + 7 = g^{-1}(x)$

Find the inverse of each function.

$$h(x) = 2x^3 + 3 \qquad g(x) = \sqrt[3]{x} - 3$$

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

$$g^{-1}(x) = (x+3)^3$$

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

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

Find the inverse of each function.
Is the inverse a function?

$$f(x)=(x+3)^2 \qquad\qquad f(x)=(x-5)^3$$