

Informal Algebra 2  
Inverses of Functions -verifying 1

Name key attached

Find the inverse of each function.

1.  $f(x) = 3x$

4.  $f(x) = 4x + 4$

2.  $f(x) = -2x - 1$

5.  $f(x) = x^2 - 9$

3.  $f(x) = x^3$

6.  $f(x) = (x - 4)^2$

Determine whether each pair of functions is inverse functions. Show proof!

7.  $f(x) = x + 6$   
 $g(x) = x - 6$

9.  $f(x) = 4x - 5$   
 $g(x) = \frac{x + 5}{4}$

8.  $f(x) = -2x + 3$   
 $g(x) = 2x - 3$

10.  $f(x) = x$   
 $g(x) = -x$

Graph each function and its inverse.

11.  $f(x) = 5x + 3$

12.  $f(x) = \sqrt{x}$

# Verifying 1

1)  $f(x) = 3x$

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

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

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

$$x = -2y - 1$$

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

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

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

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

$$\boxed{y = \sqrt[3]{x}}$$

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

$$x = 4y + 4$$

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

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

5)  $f(x) = x^2 - 9$

$$x = y^2 - 9$$

$$\sqrt{x+9} = \sqrt{y^2}$$

$$\boxed{y = \pm \sqrt{x+9}}$$

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

$$\sqrt{x} = \sqrt{(y-4)^2}$$

$$y-4 = \pm \sqrt{x}$$

$$\boxed{y = 4 \pm \sqrt{x}}$$

7)  $f(x) = x + 6$   
 $g(x) = x - 6$

$$f(g(x)) = (x-6) + 6$$
$$= x \checkmark$$

$$g(f(x)) = (x+6) - 6$$
$$= x \checkmark$$

they are inverses !!

8)  $f(x) = -2x + 3$   
 $g(x) = 2x - 3$

$$f(g(x)) = -2(2x-3) + 3$$
$$= -4x + 6 + 3$$
$$= -4x + 9 \quad !!$$

Not inverses b/c  
doesn't equal x

9)  $f(x) = 4x - 5$   
 $g(x) = \frac{x+5}{4}$

$$f(g(x)) = 4\left(\frac{x+5}{4}\right) - 5$$
$$= \frac{4x+20}{4} - 5$$

$$= x + 5 - 5$$
$$= x \checkmark$$

$$g(f(x)) = \frac{(4x-5)+5}{4}$$
$$= \frac{4x}{4}$$
$$= x \checkmark \quad !!$$

they are inverses

$$10) f(x) = x$$

$$g(x) = -x$$

$$f(g(x)) = (-x)$$

$$= -x \quad \text{||}$$

not inverses

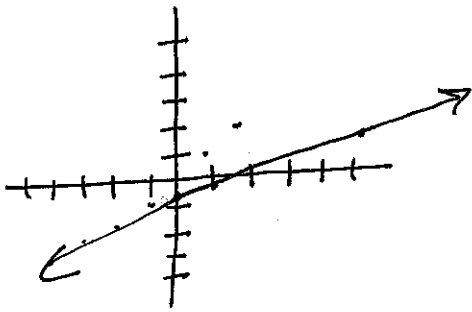
(verifying 1)

$$11) f(x) = 5x + 3$$

$$x = 5y + 3$$

$$\frac{(x-3)}{5} = \frac{5y}{5}$$

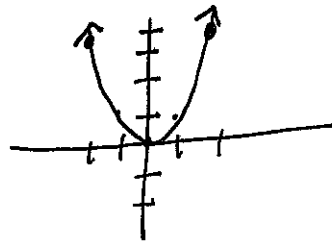
$$y = \frac{1}{5}x - \frac{3}{5}$$



$$12) f(x) = \sqrt{x}$$

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

$$y = x^2$$



| x  | y |
|----|---|
| -1 | 1 |
| 0  | 0 |
| 1  | 1 |
| 2  | 4 |
| 2  | 4 |