

Function Inverses - Test Review

State if the given functions are inverses.

1)  $g(x) = 4 - \frac{3}{2}x$   
 $f(x) = \frac{1}{2}x + \frac{3}{2}$   
 $g(f(x)) = 4 - \frac{3}{2}(\frac{1}{2}x + \frac{3}{2})$   
 $= 4 - \frac{3x}{4} + \frac{3}{2}$   
NO

2)  $g(n) = \frac{-12 - 2n}{3}$   
 $f(n) = \frac{-5 + 6n}{5}$   
 $g(f(n)) = \frac{-12 - 2(-5 + 6n)}{5}$   
 $= \frac{-12 + 10 - 12n}{5}$   
 $= \frac{-2 - 12n}{5}$   
NO

3)  $f(n) = \frac{-16 + n}{4}$   
 $g(n) = 4n + 16$   
 $f(g(n)) = \frac{-16 + (4n + 16)}{4}$   
 $= \frac{-16 + 4n + 16}{4}$   
 $= \frac{4n}{4} = n$   
 $g(f(n)) = 4(\frac{-16 + n}{4}) + 16$   
 $= -16 + n + 16 = n$   
yes

4)  $f(x) = -\frac{4}{7}x - \frac{16}{7}$   
 $g(x) = \frac{3}{2}x - \frac{3}{2}$   
 $f(g(x)) = -\frac{4}{7}(\frac{3}{2}x - \frac{3}{2}) - \frac{16}{7}$   
 $= -\frac{12x}{14} + \frac{12}{14} - \frac{16}{7}$   
NO

5)  $f(n) = -(n+1)^3$   
 $g(n) = 3 + n^3$   
 6)  $f(n) = 2(n-2)^3$   
 $g(n) = \frac{4 + \sqrt[3]{4n}}{2}$

7)  $f(x) = \frac{4}{-x-2} + 2$   
 $h(x) = -\frac{1}{x+3}$   
 8)  $g(x) = -\frac{2}{x} - 1$   
 $f(x) = -\frac{2}{x+1}$

Find the inverse of each function.

9)  $h(x) = \sqrt[3]{x} - 3$   
 $x = \sqrt[3]{y} - 3$   
 $+3 \quad +3$   
 $(x+3)^3 = (\sqrt[3]{y})^3$   
 $y = (x+3)^3$

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

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

12)  $g(x) = -4x + 1$   
 $x = -4y + 1$   
 $-1 \quad -1$   
 $\frac{(x-1)}{-4} = \frac{-4y}{-4}$   
 $y = \frac{x-1}{-4}$   
 $y = \frac{x-1}{-4}$

13)  $g(x) = \frac{7x+18}{2}$   
 $2x = \frac{7y+18}{2} \cdot 2 \rightarrow \frac{7y}{7} = \frac{2x-18}{7}$   
 $2x = \frac{7y+18}{2}$   
 $4x = 7y+18$   
 $4x-18 = 7y$   
 $y = \frac{4x-18}{7}$

14)  $f(x) = x+3$   
 $x = y+3$   
 $-3$   
 $y = x-3$

15)  $f(x) = -x+3$   
 $x = -y+3$   
 $-3$   
 $x-3 = -y$   
 $\frac{x-3}{-1} = \frac{-y}{-1}$   
 $y = -x+3$

16)  $f(x) = 4x$   
 $x = \frac{4y}{4}$   
 $y = \frac{x}{4}$

Find the inverse of each function. Then graph the function and its inverse.

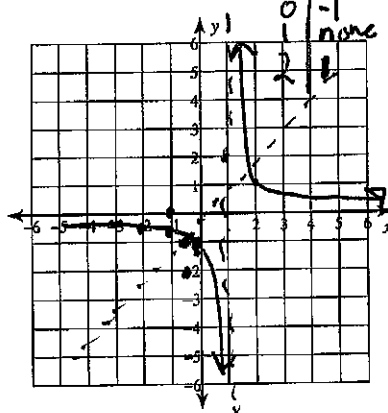
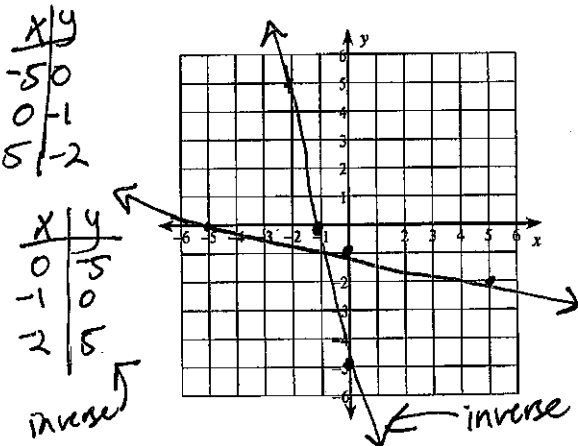
17)  $f(x) = -1 - \frac{1}{5}x$

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

x	y
-2	-1/3
-1	-1/2
0	-1
1	none

inverse  $\rightarrow$

x	y
-1/3	-2
-1/2	-1
-1	0
1	2

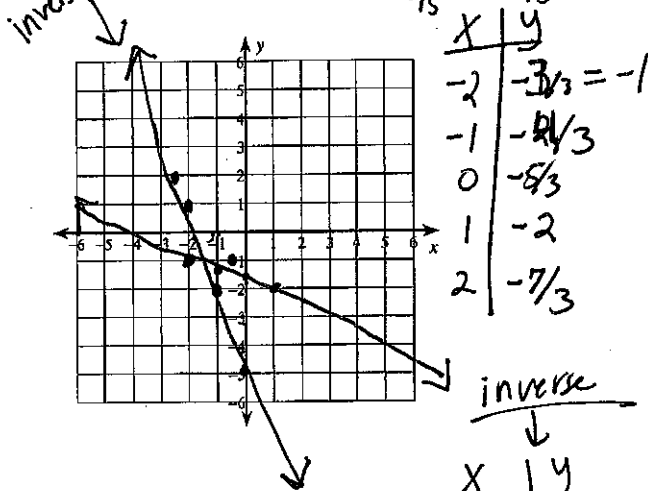
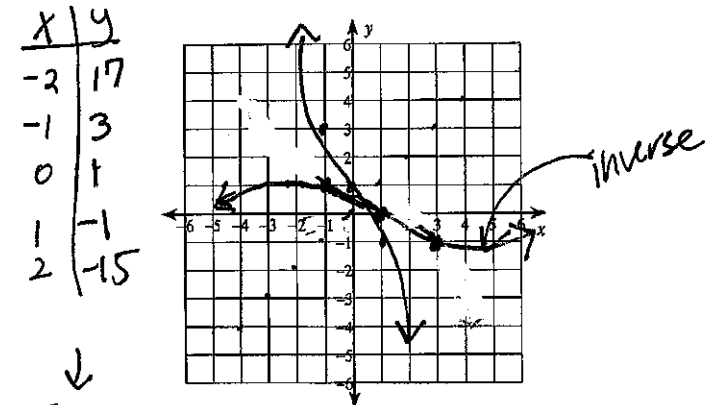


19)  $f(x) = -2x^3 + 1$

20)  $g(x) = \frac{-x-5}{3} + 0$

$3 \cdot x = -y - 5$

$3x = -y - 5 \rightarrow y = -3x - 5$



inverse

x	y
17	-2
3	-1
1	0
-1	1
-15	2

inverse

x	y
-1	-2
-4/3	-1
-5/3	0
-2	1
-7/3	2