College Math

Inverses of Functions - NOTES

Name KEY

Date _____

Find the inverse of each function.

1) $g(x) = -2x + 4$

$x = -2y + 4$

$x - 4 = -2y$

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

2) $g(x) = 5x - 20$

$x = 5y - 20$

$x + 20 = 5y$

$\frac{x}{5} + 4 = y$

3) $h(x) = -\frac{1}{2}x - \frac{5}{2}$

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

$-2 * \left(x + \frac{5}{2}\right) = -\frac{1}{2}y * -2$

$-2x - 5 = y$

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

$x = 4 - \frac{1}{3}y$

$x - 4 = -\frac{1}{3}y$

$-3x + 12 = y$

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

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

$xy = -4$

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

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

$(y+3) \cdot x = \frac{2}{y+3} \cdot (y+3)$

$(y+3)x = 2$

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

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

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

7) $f(x) = \frac{4}{-x+1} - 1$

$x = \frac{4}{-y+1} - 1$

$x + 1 = \frac{4}{-y+1}$

$(x+1)(-y+1) = 4$

$-y + 1 = \frac{4}{x+1}$

$-y = \frac{4}{x+1} - 1$

$y = \frac{-4}{x+1} + 1$

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

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

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

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

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

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

9) $f(x) = \sqrt[5]{x+3}$

$x = \sqrt[5]{y+3}$

$x^5 = y+3$

$x^5 - 3 = y$

10) $h(x) = \sqrt[5]{x} - 2$

$x = \sqrt[5]{y} - 2$

$x + 2 = \sqrt[5]{y}$

$(x+2)^5 = y$

11) $f(x) = -2x^3 - 1$

$x = -2y^3 - 1$

$x + 1 = -2y^3$

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

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

12) $g(x) = (x+2)^3 - 3$

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

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

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

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

State (and show) if the given functions are inverses.

13) $g(n) = 2n - 2$

$f(n) = \frac{n+2}{2}$

$= \frac{(2n-2)+2}{2}$

$= \frac{2n}{2}$

$= n$

YES :)

14) $h(n) = \frac{3}{2}n$

$f(n) = \frac{3n-9}{5}$

$= \frac{3(\frac{3}{2}n) - 9}{5}$

$= \frac{\frac{9}{2}n - 9}{5}$

NO

15) $g(x) = -x + 4$

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

$= \frac{(-x+4)+3}{3}$

$= \frac{-x+7}{3}$

NO

16) $g(n) = -6n - 2$

$f(n) = \frac{-n-2}{6}$

$= \frac{-(-6n-2)-2}{6}$

$= \frac{6n+2-2}{6}$

$= \frac{6n}{6} = n$

YES