

Verifying Inverse Relations # 2

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State if the given functions are inverses.

1) $f(x) = \frac{-2x+6}{7}$

$h(x) = \frac{6-7x}{2}$

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

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

3) $f(x) = -\frac{1}{10}x + \frac{1}{2}$

$h(x) = -10x + 5$

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

$g(x) = 2x + 2$

5) $h(x) = 2x + 3$

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

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

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

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

$g(x) = -x - 1$

8) $g(x) = x - 6$

$f(x) = x + 6$

9) $f(x) = \frac{-8+3x}{4}$

$g(x) = \frac{4x+8}{3}$

10) $f(x) = -7x + 3$

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

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

$f(x) = -x + 5$

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

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

13) $f(x) = \frac{3}{8}x + \frac{5}{2}$

$h(x) = \frac{8}{3}x - \frac{20}{3}$

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

$f(x) = 9x + 4$

$$g(f(x)) = -2(9x+4) + 1$$

$$= -18x - 8 + 1$$

NOT inverses

Verifying #2

$$1) f(h(x)) = -2\left(\frac{6-7x}{2}\right) + 6$$

$$= \frac{(6-7x)+6}{2}$$

$$= \frac{7x}{2} \quad \parallel$$

Not Inverse

$$3) f(h(x)) = -\frac{1}{10}(-10x+5) + \frac{1}{2}$$

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

$$= x \quad \parallel$$

$$h(f(x)) = -10\left(\left(-\frac{1}{10}x\right) + \frac{1}{2}\right) + 5$$

$$= x - 5 + 5$$

$$= x \quad \checkmark$$

they are inverses

$$5) h(f(x)) = 2\left(\frac{x-3}{2}\right) + 3$$

$$= x \quad \parallel \quad \checkmark$$

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

$$= x \quad \checkmark$$

inverses

$$2) f(g(x)) = \frac{1}{8}\left(\frac{6-x}{2}\right) - \frac{3}{8}$$

$$= \frac{6-x}{16} - \frac{3}{8}$$

$$= \frac{3}{8} - \frac{x}{16} - \frac{3}{8} = -\frac{x}{16} \quad \parallel$$

Not Inverse

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

$$= -2x - 2 + 4$$

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

NO

$$6) f(x) = \frac{-3x+3}{4} \quad g(x) = \frac{3-4x}{3}$$

$$f(g(x)) = \frac{-3\left(\frac{3-4x}{3}\right) + 3}{4}$$

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

$$= x \quad \checkmark$$

$$g(f(x)) = \frac{3-4\left(\frac{-3x+3}{4}\right)}{3}$$

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

$$= x \quad \checkmark$$

Inverses

$$7) f(g(x)) = \frac{3 - (-x-1)}{3}$$

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

NO

$$9) f(g(x)) = \frac{-8 + 3(4x+8)}{4}$$

$$= \frac{-8 + 4x + 8}{4}$$

$$= x \checkmark$$

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

$$= \frac{-8 + 3x + 8}{3}$$

= x ✓

inverses

$$12) g(f(x)) = -2\left(\frac{2-x}{2}\right) + 2$$

$$= -2 + x + 2$$

$$= x \checkmark$$

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

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

inverse = x ✓

$$8) g(f(x)) = (x+6) - 6$$

$$= x \checkmark$$

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

$$= x \checkmark$$

inverses

$$10) f(g(x)) = -7\left(\frac{3x-3}{4}\right) + 3$$

$$= \frac{-21x+21}{4} + 3$$

NO

$$11) h(f(x)) = 3 - \frac{1}{4}(-x+5)$$

$$= 3 + \frac{1}{4}x + 5$$

NO

$$13) f(h(x)) = \frac{3}{8}\left(\frac{8}{3}x - \frac{20}{3}\right) + \frac{5}{2}$$

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

$$= x \checkmark$$

$$h(f(x)) = \frac{8}{3}\left(\frac{3}{8}x + \frac{5}{2}\right) - \frac{20}{3}$$

$$= x + \frac{20}{3} - \frac{20}{3}$$

= x ✓
inverses