

Section 7-1 & 7-2
Review

Name KEY

For #1-10, use the following functions: $f(x) = 4x + 3$ $g(x) = 2x - 5$ $h(x) = x^2 - 1$

1) Find $(f + g)(x)$

$$= 4x + 3 + 2x - 5$$

$$= 6x - 2$$

2) Find $(h - g)(x)$

$$= (x^2 - 1) - (2x - 5)$$

$$= x^2 - 1 - 2x + 5$$

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

3) Find $(f \cdot g)(x)$

$$= (4x + 3)(2x - 5)$$

$$= 8x^2 - 20x + 6x - 15$$

$$= 8x^2 - 14x - 15$$

4) Find $(h \circ f)(x)$

$$h(x) = x^2 - 1$$

$$= (\quad)^2 - 1$$

$$= (4x + 3)^2 - 1$$

$$= (4x + 3)(4x + 3) - 1$$

$$= 16x^2 + 24x + 8$$

For the following problems, plug in the number for one function, then take each answer to plug into the next function.

5) $f(g(7))$

$$g(7) = 2(7) - 5 = 9$$

$$f(9) = 4(9) + 3 = 39$$

$$f(g(7)) = 39$$

6) $h[f(-2)]$

$$f(-2) = 4(-2) + 3 = -5$$

$$h(-5) = (-5)^2 - 1 = 24$$

$$h[f(-2)] = 24$$

7) $(g \circ h)(5)$

$$h(5) = 5^2 - 1 = 24$$

$$g(24) = 2(24) - 5 = 43$$

$$(g \circ h)(5) = 43$$

8) $g[f(11)]$

$$f(11) = 4(11) + 3 = 47$$

$$g(47) = 2(47) - 5 = 89$$

$$g[f(11)] = 89$$

9) $f(g(h(1)))$

$$h(1) = 1^2 - 1 = 0$$

$$g(0) = 2(0) - 5 = -5$$

$$f(-5) = 4(-5) + 3 = -17$$

$$f(g(h(1))) = -17$$

10) $h[(g \circ f)(-3)]$

$$f(-3) = 4(-3) + 3 = -9$$

$$g(-9) = 2(-9) - 5 = -23$$

$$h(-23) = (-23)^2 - 1 = 528$$

$$h[(g \circ f)(-3)] = 528$$

For each pair of functions (in coordinate form), find $f \circ g$ and $g \circ f$, if they exist. If one does not exist do not include it in your answer.

11) $f = \{(1, -9), (0, 0), (-3, 8), (-5, -5)\}$
 $g = \{(0, -3), (-5, 0), (-7, 1), (-9, 0)\}$

$$f \circ g = \{(0, 8), (-5, 0), (-7, -9), (-9, 0)\}$$

$$g \circ f = \{(1, 0), (0, -3), (-5, 0)\}$$

12) Use the same functions listed in #11, but this time write their inverse functions.

$$f^{-1} = \{(-9, 1), (0, 0), (8, -3), (-5, -5)\}$$

$$g^{-1} = \{(-3, 0), (0, -5), (1, -7), (9, 9)\}$$

13) Prove (or disprove) the following functions are inverses of one another. (find $f \circ g$ and $g \circ f$ to determine if the both equal "x")

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

$$g(x) = \frac{1}{2}x + 9$$

$f \circ g$	$g \circ f$
$2\left(\frac{1}{2}x + 9\right) - 9$ $x + 18 - 9$ $x + 9 \neq x \quad \leftarrow \text{NOT } = x \quad (\text{NOT INVERSES})$	

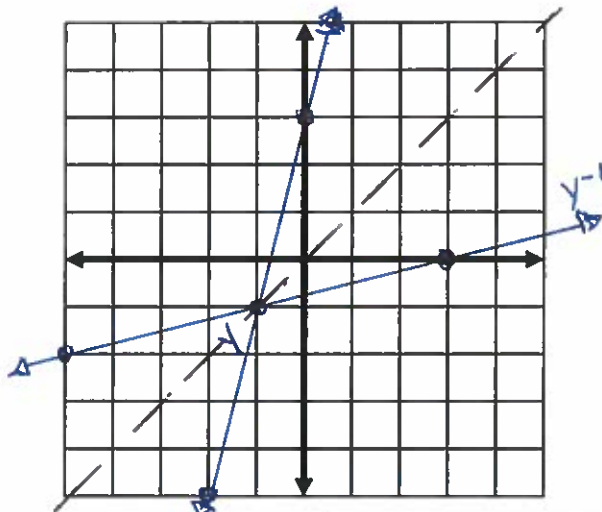
For the following functions; a) find their inverse equation – show work in the box, b) graph both the original function and its inverse on the grid provided. Be sure to label each as either "y" or "y⁻¹".

14) $y = 4x + 3$

$$x = 4y + 3$$

$$x - 3 = 4y$$

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

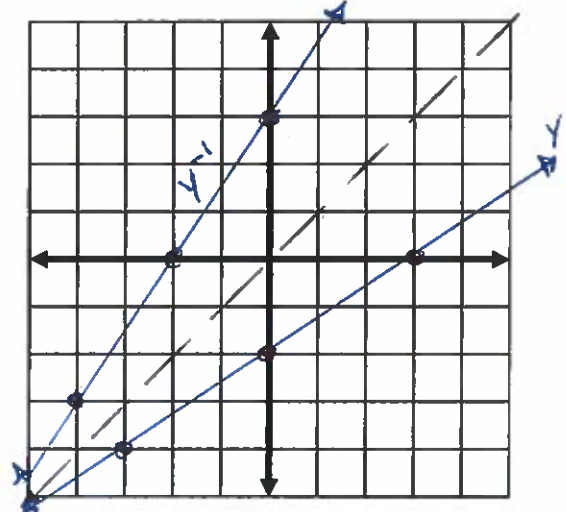


15) $y = \frac{2}{3}x - 2$

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

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

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



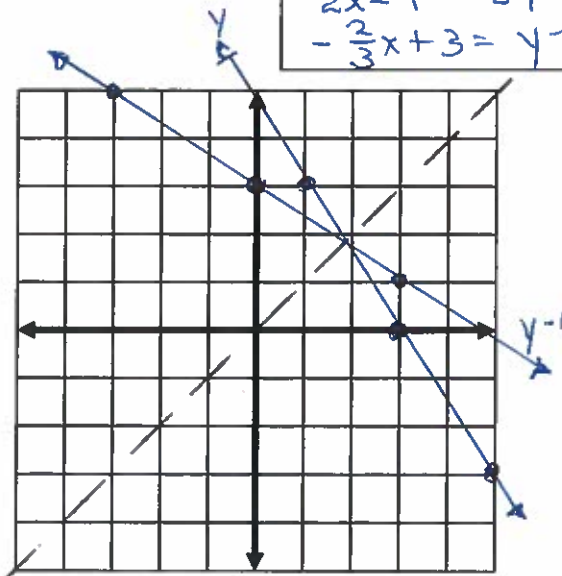
16) $f(x) = \frac{9 - 3x}{2}$

$$x = \frac{9 - 3y}{2}$$

$$2x = 9 - 3y$$

$$2x - 9 = -3y$$

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



17) $y = 4$

$$x = 4$$

