

Review 9.4 and 9.5

Name Key
Period _____

Given: $f(x) = 5x - 3$ and $g(x) = 3x^2 - 2x + 4$, find each function.

1. $(f+g)(x) = \underline{3x^2 + 3x + 1}$

2. $(f-g)(x) = \underline{-3x^2 + 7x - 7}$

3. $(g-f)(x) = \underline{3x^2 - 7x + 7}$

Given: $f(x) = x^2 - 6x + 5$ and $g(x) = x^2 - 2x - 15$, find each function. State the domain of each.

4. $(fg)(x) = \underline{(x-5)(x-1)(x+3)(x-5)^2}$

Domain All Reals

5. $\left(\frac{f}{g}\right)(x) = \underline{\frac{x-1}{x+3}}$

Domain All but $x \neq 5$ and $x \neq -3$

6. $\left(\frac{g}{f}\right)(x) = \underline{\frac{x+3}{x-1}}$

Domain All but $x \neq 5$ and $x \neq 1$

Given: $f(x) = -\frac{1}{2}x + 8$ and $g(x) = 3x^2 - x + 2$, find each value.

7. $f(g(-2)) = \underline{0}$ 8. $g(f(-2)) = \underline{236}$ 9. $g(f(-6)) = \underline{354}$

Given: $f(x) = \frac{1}{x-2}$ and $g(x) = \sqrt{x-3}$, find each function. State the domain of each.

10. Domain of $f = \underline{\text{All but } x \neq 2}$ Domain of $g = \underline{[3, +\infty)}$

Write the composition function: $f(g(x)) = \underline{-\frac{3}{2}x^2 + \frac{1}{2}x + 7}$

Domain of $f(g(x))$ All Reals

Key

Find the inverse of each function using inverse function notation. Determine whether the inverse is a function and state its domain and range.

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

Inverse $f^{-1}(x) = \frac{x+3}{5}$

Is the inverse a function? Yes/no yes

Domain All reals

Range All reals

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

$$x+3 = 5y$$
$$\frac{x+3}{5} = y$$

12. $h(x) = \frac{3x+2}{7}$

Inverse $h^{-1}(x) = \frac{7x-2}{3}$

Is the inverse a function? Yes/no yes

Domain All reals

Range All reals

$$y = \frac{3x+2}{7}$$

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

$$7x = 3y+2$$

$$\frac{7x-2}{3} = y$$

$$y = \frac{7x-2}{3}$$

Determine by composition whether these functions are inverses. Show all work.

13. $f(x) = \frac{1}{2}x + 4$ and $g(x) = 2x - 8$

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

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

yes