

Name: Key

Function operation & domain practice

In exercises 1 – 4, given function f and g , find: a.) $f + g$ b.) $f - g$ c.) $f \cdot g$ d.) $\frac{f}{g}$ and state the domain of each

1.) $f(x) = 2x + 1$
 $g(x) = 1 - x$

$$f + g(x) = x + 2 \quad D: \mathbb{R}$$

$$f - g(x) = 3x \quad D: \mathbb{R}$$

$$f \cdot g(x) = -2x^2 + x + 1 \quad D: \mathbb{R}$$

$$f/g(x) = \frac{2x+1}{1-x} \quad D: x \neq 1$$

2.) $f(x) = 2x^2 - x$
 $g(x) = x^2 - 4$

$$f + g(x) = 3x^2 - x - 4 \quad D: \mathbb{R}$$

$$f - g(x) = x^2 - x + 4 \quad D: \mathbb{R}$$

$$f \cdot g(x) = 2x^4 - x^3 - 8x^2 + 4x \quad D: \mathbb{R}$$

$$f/g(x) = \frac{2x^2 - x}{x^2 - 4} \quad D: x \neq 2, -2$$

3.) $f(x) = \frac{2x+3}{x-4}$

$$g(x) = \frac{x-4}{3x+2}$$

$$f + g(x) = \frac{7x^2 + 5x + 22}{3x^2 - 10x - 8} \quad D: x \neq 4, -2/3$$

$$f - g(x) = \frac{5x^2 + 21x - 10}{3x^2 - 10x - 8} \quad D: x \neq 4, -2/3$$

$$f \cdot g(x) = \frac{2x+3}{3x+2} \quad D: x \neq 4, -2/3$$

$$f/g(x) = \frac{6x^2 + 13x + 6}{x^2 - 8x + 16} \quad D: x \neq 4, -2/3$$

4.) $f(x) = \sqrt{x-1}$

$$g(x) = 2x^2$$

$$f + g(x) = \sqrt{x-1} + 2x^2 \quad D: x \geq 1$$

$$f - g(x) = \sqrt{x-1} - 2x^2 \quad D: x \geq 1$$

$$f \cdot g(x) = 2x^2 \sqrt{x-1} \quad D: x \geq 1$$

$$f/g(x) = \frac{\sqrt{x-1}}{2x^2} \quad D: x \geq 1$$

In exercise 5 – 8 for the given function f and g , find the composition functions: a.) $f \circ g$ b.) $g \circ f$ and state the domain of each.

5.) $f(x) = 2x + 1$

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

$$f \circ g(x) = 2x^2 - 4 \quad D: \mathbb{R}$$

$$g \circ f(x) = 4x^2 + 4x - 1 \quad D: \mathbb{R}$$

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

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

$$f \circ g(x) = \frac{2}{x-1} \quad D: x \neq 1$$

$$g \circ f(x) = \frac{2x-4}{x-3} \quad D: x \neq 3$$

7.) $f(x) = \sqrt{2-x}$

$$g(x) = x^2 + 2$$

$$f \circ g(x) = \sqrt{-x^2} \quad D: x = 0$$

$$g \circ f(x) = -x + 4 \quad D: x \leq 2$$

8.) $f(x) = x^3 + 4$

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

$$f \circ g(x) = x \quad D: \mathbb{R}$$

$$g \circ f(x) = x \quad D: \mathbb{R}$$