

Learning Activity – Sections 6.3 & 6.4 – Algebra of Functions, Function Composition, and Difference Quotients

Names: _____

1. For (a) – (d), evaluate the functions for the given values of x . Refer to the function f , g , and h given below.

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

$$g(x) = \sqrt{8-x}$$

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

a. $(g+h)(3)$

b. $(f-g)(-1)$

c. $(g \cdot h)(0)$

d. $\left(\frac{h}{f}\right)(5)$

2. Refer to the functions r , s , and t below. For (a) – (d) find the indicated function and write the domain in interval notation.

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

$$s(x) = 9 - x^2$$

$$t(x) = \sqrt{x-2}$$

a. $(r-t)(x)$

b. $\left(\frac{s}{t}\right)(x)$

Domain: _____

Domain: _____

c. $(r \cdot s)(x)$

d. $\left(\frac{t}{s}\right)(x)$

(Hint: This function can be simplified if we factor out -1 .)

Domain: _____

Domain: _____

3. Refer to the functions f and g below. For (a) – (c) evaluate the functions for the given value of x .

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

$$g(x) = 2x - 8$$

a. $(f \circ g)(9)$

b. $(g \circ f)(6)$

c. $(f \circ g)(6)$

d. Find $(f \circ g)(x)$.

e. Give the domain of $(f \circ g)(x)$ in interval notation.

f. Find $(g \circ f)(x)$.

g. Give the domain of $(g \circ f)(x)$ in interval notation.

4. Given $g(x) = \frac{2}{5-x}$ and $h(x) = \sqrt{x-4}$, find $(g \circ h)(x)$ and write the domain in interval notation.

5. The graphs of two functions are shown below. Evaluate the function at the given values of x .

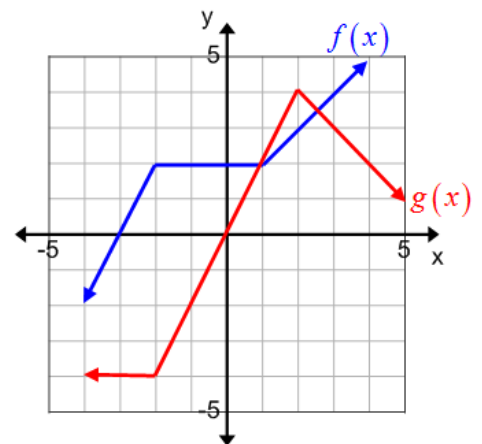
a. $(f - g)(3)$

b. $\left(\frac{g}{f}\right)(-2)$

c. $(g \circ f)(1)$

d. $(f \circ g)(0)$

e. $(f \circ f)(0)$



6. Given $f(x) = 3x^2 + 2x + 5$, find the difference quotient.