

Name: _____

MATH 101

Fall 2023

HW 9: Due 10/30

*“Mathematics is the most beautiful and
most powerful creation of human spirit.”
– Stefan Banach*

Problem 1. (10pt) Values for several functions are given in the table below.

x	-3	-2	-1	0	1	2	3
$f(x)$	4	8	-1	5	-3	0	-2
$g(x)$	1	6	0	-6	-7	-3	1
$h(x)$	-4	0	3	5	10	3	9

Given the data above, compute the following:

(a) $(h + g)(-2) =$

(b) $(f - g)(0) =$

(c) $(5h)(1) =$

(d) $\left(\frac{h}{f}\right)(1) =$

(e) $g(-3)h(3) =$

(f) $g(-1 - f(3)) =$

(g) $(h \circ g)(2) =$

(h) $(g \circ h)(2) =$

(i) $(f \circ g)(-1) =$

(j) $(h \circ g \circ f)(1) =$

Problem 2. (10pt) Suppose $f(x)$ and $g(x)$ are the functions given below.

$$f(x) = 2x - 3$$

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

Compute the following:

(a) $f(5) =$

(b) $g(-2) =$

(c) $f(0) - 3g(2) =$

(d) $f(x) - g(x) =$

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

(f) $\left(\frac{f}{g}\right)(x) =$

(g) $(f \circ g)(0) =$

(h) $(g \circ f)(0) =$

(i) $(f \circ g)(x) =$

(j) $(g \circ f)(x) =$

Problem 3. (10pt) Let $f(x)$ be the function given by $f(x) = 3x - 7$.

- (a) Find a value in the range of f . Be sure to justify why the value is in the range.
- (b) Compute $f(4)$. Is $(4, 1)$ on the graph of f ? Explain.
- (c) Is there an x such that $f(x) = 11$? Explain.
- (d) Is $1 \in f^{-1}(3)$? Explain.
- (e) Assuming f^{-1} exists, what is $f(f^{-1}(\pi))$ and $f^{-1}(f(\sqrt{2}))$?