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

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

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

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

(e) $(fg)(x) =$

(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 $f^{-1}(f(\sqrt{2}))$?