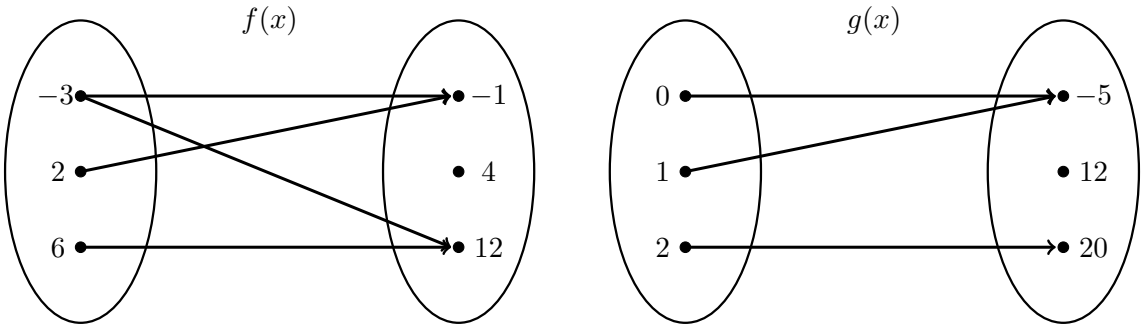
Name: _____

MATH 101
Spring 2022
HW 6: Due 02/24

"Honey, it's just the way your brain was hardwired. Plenty of great, intelligent, funny, interesting, and creative people have struggled with the same things you struggle with."

–Leslie Bennett, Euphoria

Problem 1. (10pt) Determine if the relations $f(x)$ and $g(x)$ shown below are functions. Explain why or why not. If the relation is a function, determine its domain, codomain, and range.



Problem 2. (10pt) Determine if the relations $f(x)$ and $g(x)$ shown below are functions. Explain why or why not. If the relation is a function, compute the functions value at $x = 10$.

$$f(x) = 47.3 - 17.9x$$

$$g(x) = 2x^2 + 5x - 6$$

Problem 3. (10pt) Suppose $f(x)$ and $g(x)$ are the functions given below.

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

Compute the following:

(a) $(f+g)(3) =$

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

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

(d) $\left(\dfrac{h}{g}\right)(-3) =$

(e) $f(2)\,h(-2) =$

(f) $h(-1-f(0)) =$

(g) $(g \circ f)(-2) =$

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

(i) $(g \circ h)(1) =$

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

Problem 4. (10pt) Suppose $f(x)$ and $g(x)$ are the functions given below.

$$f(x) = 3x - 10$$

$$g(x) = 2x^2 - x + 5$$

Compute the following:

(a) $f(3) =$

(b) $g(-2) =$

(c) $5f(6) - g(1) =$

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

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

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

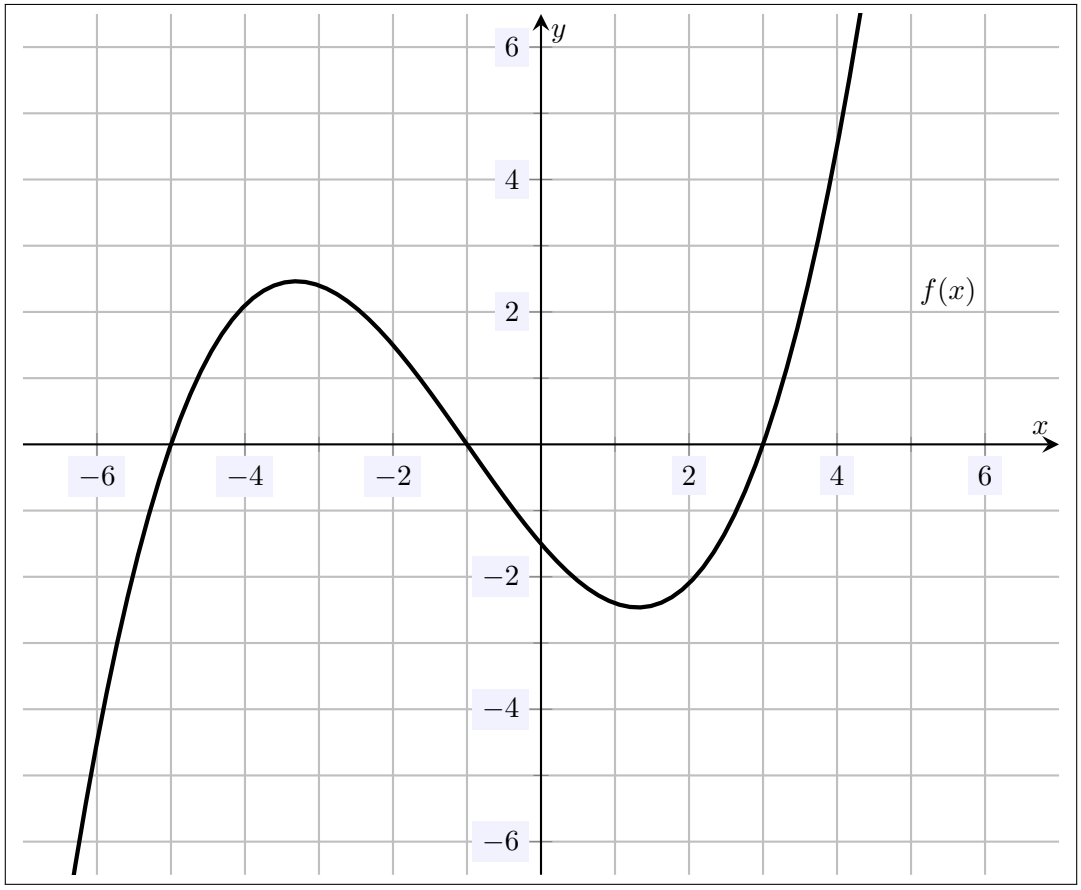
(g) $(f \circ g)(0) =$

(h) $(g \circ f)(3) =$

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

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

Problem 5. (10pt) Determine if the relation below is a function or not. If it is a function, explain why. If it is not a function, explain why. Determine also whether the relation has an inverse function. If it has an inverse function, explain why. If it does not have an inverse function, explain why not.



Problem 6. (10pt) Determine whether the point $(2, -1)$ is on the graph of $f(x) = 2x^2 - 5x + 3$. Determine also whether the point $(1, 0)$ is on the graph of $f(x)$. For each, explain why or why not.