

Name: \_\_\_\_\_

MATH 101

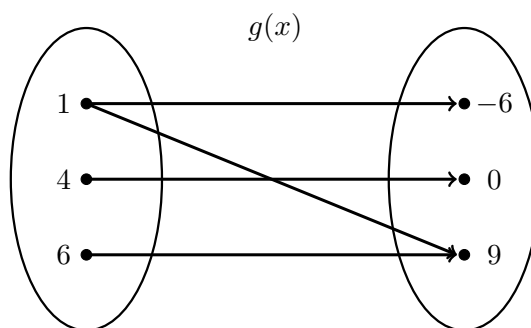
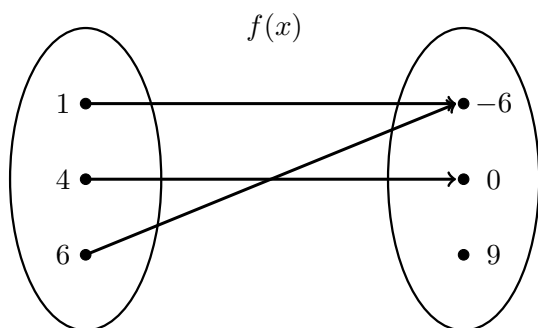
Fall 2021

HW 5: Due 10/08

*"The economy stinks, bees are dying, and movies are pretty much all sequels now."*

*– Winston Saint-Marie Schmidt, New Girl*

**Problem 1.** (10pt) Determine if the relations  $f(x)$  and  $g(x)$  shown below are functions. Explain why or why not.



**Problem 2.** (10pt) Determine if the relations  $f(x)$  and  $g(x)$  shown below are functions. Explain why or why not.

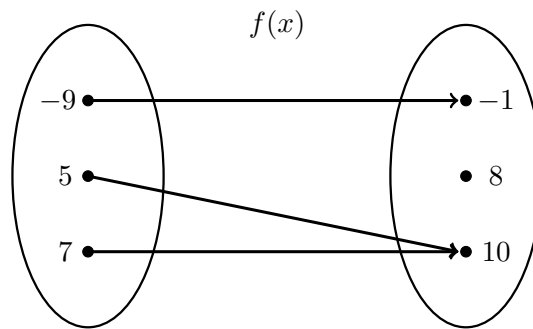
$x$	$f(x)$	$x$	$g(x)$
1	8	5	2
2	-7	6	$\pi$
3	8	8	1.87
4	8	9	-9
5	10	5	3

**Problem 3.** (10pt) Determine if the relations  $f(x)$  and  $g(x)$  shown below are functions. Explain why or why not.

$$f(x) = 2.54x + 91$$

$$g(x) = x^3 - x + 1$$

**Problem 4.** (10pt) Suppose  $f(x)$  is the function given below.



- (a) What is the domain of  $f(x)$ ?
- (b) What is the codomain of  $f(x)$ ?
- (c) What is the range of  $f(x)$ ?

**Problem 5.** (10pt) Suppose  $f(x)$  and  $g(x)$  are the functions given below.

$x$	-2	0	1	3	4	5	10
$f(x)$	5	-3.1	$\pi$	5	$3/2$	14	0
$g(x)$	6	4	6.6	-15	4	9	2

Compute the following:

(a)  $f(1) =$

(b)  $g(0) =$

(c)  $(f + g)(5) =$

(d)  $(f - g)(-2) =$

(e)  $(6f)(1) =$

(f)  $\left(\frac{f}{g}\right)(10) =$

(g)  $f(4)g(5) =$

(h)  $f(2 - g(0)) =$

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

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

**Problem 6.** (10pt) Suppose  $f(x)$  and  $g(x)$  are the functions given below.

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

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

Compute the following:

(a)  $f(1) =$

(b)  $g(0) =$

(c)  $f(1) - 2g(1) =$

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

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

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

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

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

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

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