MAT 1375, Classwork6, Fall2024

ID:____ Name:____

1. Let f and g be the functions defined by the table below. Complete the table by performing the indicated operations.

x	1	2	3	4	5	6	7
$f(x)$	4	5	7	0	-2	6	4
$g(x)$	6	-8	5	2	9	11	2
$g(x)+3$							
$f(x)-2g(x)$							
$g(x+3)$							
$(f \circ g)(x)$							
$(g \circ f)(x)$							
$(g \circ g)(x)$							

2. Complete the definition of the **one-to-one function** (or **injective**):

Given a function $f(x)$. If any two different inputs ______________ always have different outputs ______________, then we call this function f a **one-to-one function**.

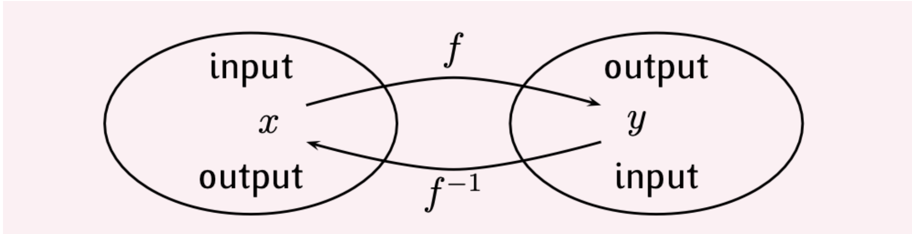
3. **Horizontal Line test**:

A function is one-to-one when every horizontal line intersects the graph of the function __________________________________.

4. Complete the definition of **the Inverse of a Function**:

Let f be a function with domain D_f and the range R_f, and assume that f is one-to-one. The **inverse** of f is the function f^{-1}, determined by:

$$f(x) = y \text{ means precisely that } \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_$$



Therefore, we have $D_{f^{-1}} =$_______, and $R_{f^{-1}} =$_________.

5. How to check if two given functions are **inverse** with each other:

   Let f and g be two functions such that

   ______________________________ for every x in the domain of g **and**

   ______________________________ for every x in the domain of f.

   The function g is the **inverse of the function** $\boldsymbol{f}$ and is denoted by ___________.

6. How to find the inverse function for a given **invertible** function $f(x)$:

   Step1: _______________________

   Step2: _______________________

   Step3: _______________________

   Step4: _______________________

7. Given a function $f(x) = x^2 + 1\,, x \geq 0$. a) Find the inverse function of $f(x)$. b) Graph f and f^{-1} in the same coordinate system.