Math 197

Ins and Outs of Functions

1. Below are several tables for a function machine. Fill in the missing numbers. On the last line write a formula for the output given variable input.

a.

In	Out
5	19
-2	-2
3	13
1	7
0	
-1	
k	

b.

In	Out
4	15
-3	8
6	35
1	0
3	
5	
g	

c.

In	Out
2	12
4	48
1	6
-2	3/4
0	
3	
d	

d

In	Out
-3	3.5
6	3.5
1	3.5
0	3.5
-2	
5	
a	

2. Below is the table for a function machine that accepts letters as inputs and gives numbers as outputs. Fill in the missing numbers and/or letters, and write a description of how the machine operates. Will any of the outputs be even numbers?

In	Out
e	11
h	17
b	5
a	
d	
	7
	51

3. Below is the table for a function that accepts English words as input and gives letters as outputs. Fill in the missing words and/or letters, and write a description of how the machine operates.

In	Out
some	o
taken	a
airport	a
special	e
pickle	
	u

4. To be a certified function machine, a machine must obey the following rule:

   For any valid input, there is exactly one output.

   That means, a machine cannot give different outputs for the same input. But it can give the same output for two different inputs. The **domain** is set of "valid" inputs and the **range** is the set of outputs.

   In mathematics, a function must obey this rule, or it is not considered a function.

   a. Describe a machine that takes numbers as inputs and give numbers as outputs, but does **not** qualify as a function machine.

   b. Describe a machine that takes numbers as inputs and gives words as outputs, but does **not** qualify as a function machine.

   c. Describe a machine that is a function machine but gives the same output for different inputs.

5. The set or collection of inputs that are allowed is called the **domain** of the function.

   a. Describe the domain for the function machine in problem 1. What numbers will the machine produce outputs for?

   b. Describe the domain for the function machine in problem 3.

   c. Describe a function machine that takes numbers for both inputs and outputs but whose domain is not all numbers. In other words there are some numbers this machine would not make an output for?

   d. Describe a function machine that takes numbers for inputs and letters for outputs but whose domain is not all numbers.

6. The set or collection of outputs for the function that are possible is called the **range** of the function.

   a. Describe the range of the functions in problem 1.

   b. Describe the range of the function in problem 2.

   c. Describe the range of the function in problem 3.

7. Make up a function for another group to try to describe.