Technical Definition of Functions

Work within a small group to answer these questions. Do not race through the exercises on your own. Always make sure that your entire group feels good about a question and answer before you move to the next exercise. Ask your group mates for explanations if you feel uncertain about something, and offer your explanations to others when you understand an exercise but someone else may not.

1. A function named C is given by $\{(1,2),(2,4),(3,6),(4,6),(5,8)\}$.

   a) What are the domain and range of C? Give your answers using set notation (with the curly braces).

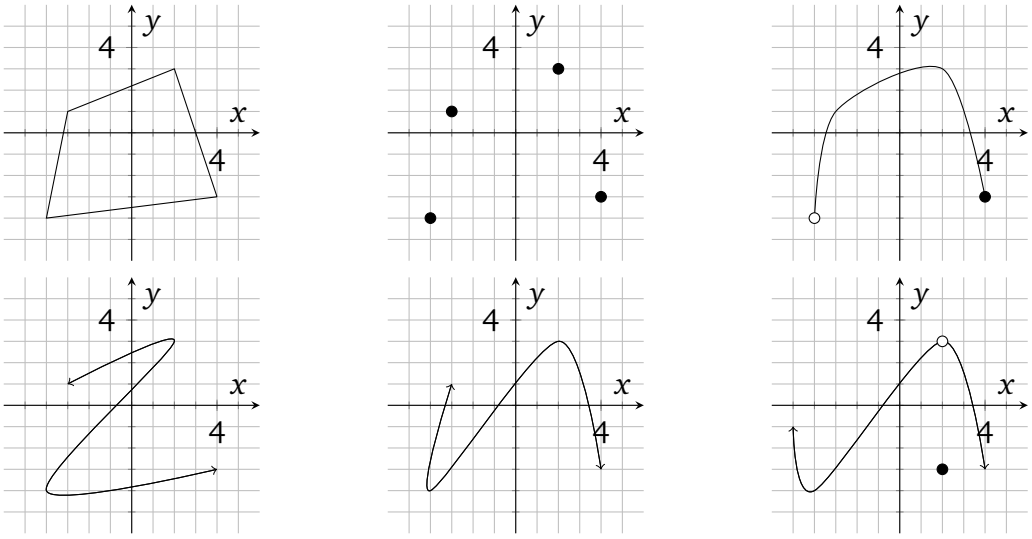
   b) Graph C.

   c) What is $C(2)$? What is $C(6)$?

   d) Solve the equation $C(x) = 8$.

   e) Solve the equation $C(x) = 0$.

2. Here are some graphs that give relations between x and y. Your job is to determine if the relation can be used to define y as a function of x. For each graph, after you make your decision, say a little bit about why. If you decide that the relation *can* be used to define a function, then you can just say that. But if it *cannot*, then give a reason why. For example, you might say something like "There is more that one possibility for what $f(2)$ would be."



3. Which of these tables describe y as a function of x? For each table, after you make your decision, say a little bit about why. If you decide that the relation *can* be used to define a function, then you can just say that. But if it *cannot*, then give a reason why. For example, you might say something like "There is more that one possibility for what $f(2)$ would be."

x	y
1	-12
2	10
3	8
4	5
5	13
6	11

x	y
10	3
15	4
20	3
25	4
30	3
35	4

x	y
-12	9
10	8
8	3
5	-2
13	1
11	1

x	y
2	-2
4	17
5	1
8	8
4	13
5	10

x	y
3	-1
8	10
7	14
7	14
12	13
16	-9

x	y
red	Mercury
orange	Venus
yellow	Earth
green	Mars
blue	Jupiter
purple	Saturn

4. For each of these relations between x and y, decide if y is a function of x.

   a) $y = 3x - 2$ b) $2y = 3x - 2$ c) $y^2 = 3x - 2$

   d) $x^2 + y^2 = 4$ e) $|x| - y^2 = x^2$ f) $y = \pm\sqrt{x}$

5. Let x represent the height of a person, and y represent their weight. Is y a function of x? If not, explain why not.

6. Let x represent the weight of a (1 foot) × (1 foot) × (1 foot) package you want to send through the postal service, and y represent the cost to ship it. Is y a function of x? If not, explain why not.

7. In the same scenario as the previous question, is x a function of y? If not, explain why not.