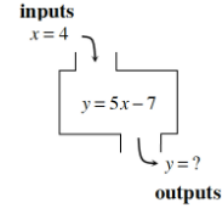
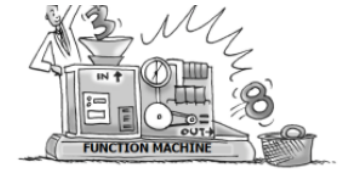


Looking at Functions

A **function** works like a machine. Numbers are put into the machine one at a time, and then the rule performs the operation(s) on each input to determine each output. For example, when $x = 3$ is put into a machine with the rule $y = 5x - 7$, the rule multiplies the input, 3, by 5 and then subtracts 7 to get the output, which is 8. This input and output can be written as an ordered pair: (3, 8). Then it can be placed on an xy -coordinate graph.



- a. Find the output of the function machine at right when the input is $x = 4$.
- b. Likewise, find y when $x = -1$ and $x = 10$.
- c. If the output of this relation is 45, what was the input? That is, if $y = 45$, then what is x ? Is there more than one possible input?

8-118. Some relationships are special in that they are called **functions**. Below are two relationships, one of which ($y = x^2 - 2$) is a function and the other, ($x = y^2 - 2$), is not. Look at the graph and table of values below for each relationship and discuss with your team why you think the relationship in part (a) is a function and the one in part (b) is not. Use your ideas to create a definition of a function. Be prepared to share your ideas with the rest of the class. Use these questions to guide your discussion:

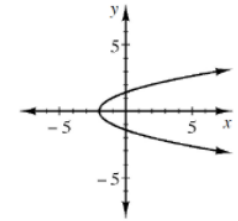
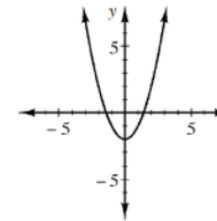
- a. What is similar about the two relationships?
- b. What is different about the two relationships?
- c. What can we predict about the outputs for each relationship for a given input?

$$y = x^2 - 2$$

x	-3	-2	-1	0	1	2	3
y	7	2	-1	-2	-1	2	7

$$x = y^2 - 2$$

x	7	2	-1	-2	-1	2	7
y	-3	-2	-1	0	1	2	3

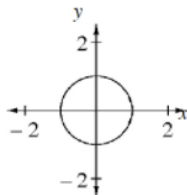


8-119. Examine each of the relationships below. Compare the inputs and outputs of each relation and decide if the relationship is a function. Explain your reasoning. Use your definition of a function from problem 8-118 to help you justify your conclusion.

a.

x	7	-2	0	4	9	-3	6
y	6	-3	4	2	10	-3	0

c.



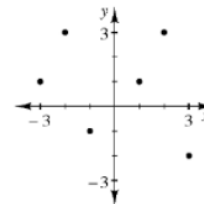
e.

x	y
-8	11
4	3
11	-8
6	3
-8	11

b.

x	3	-1	2	0	1	2	9
y	4	-5	9	7	4	-8	2

d.



f.

