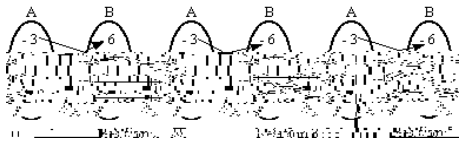


# Study Guide

Functions\_Relations A  
03/01/2012

## Functions/Relations - A

A relation is a set of ordered pairs that represent a relationship between the elements of the two sets. A function is a special type of relation, where each element of the first set ( $x$ -values) corresponds to an unique element of the second set ( $y$ -values). The first set of numbers is commonly known as the input and the second set as the output. The input, or  $x$ -values, are entered into the equation. Once evaluated, the result is the output, or  $y$ -values. In other words, in order for a relation to be a function, for each  $x$ -value there can be no more than one value of  $y$ . Some examples of relations are given below, with input values in A mapped to output values in B.



Relations 1 and 2 are functions, while relation 3 is not a function. The input value - 1 in relation 3 is matched to more than one output value (3 and 5), so the relation is not a function.

### Example 1:

Which of the following relations is not a function?



### Solution:

If there is a value of  $x$  resulting in more than one value of  $y$ , the relation is not a function. This only occurs in the third set of numbers with  $(9, -1)$  and  $(9, 4)$ . Therefore, set C is not a function.

**Answer:** Set C is not a function.

### Example 2:

Which of the following points, if removed from the set, would make the set a function?

$((-4, 5), (4, -5), (-4, 4), (-5, 5), (5, -4))$

### Solution:

The ordered pairs  $(-4, 5)$  and  $(-4, 4)$  have the same  $x$  values but different  $y$  values. Therefore, if either point is removed from the set, the remaining ordered pairs will represent a function.

**Answer:** Remove either  $(-4, 5)$  or  $(-4, 4)$ .