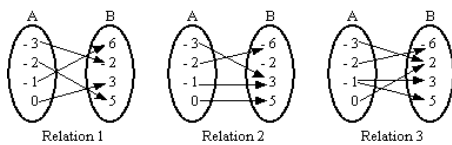


Study Guide

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 a 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?

- (A) $\{(6, -9), (12, 4), (-10, -3), (4, 12)\}$
- (B) $\{(7, -10), (4, 4), (-7, 10), (11, -5)\}$
- (C) $\{(9, -1), (-12, -1), (9, 4), (15, -11)\}$
- (D) $\{(7, -1), (9, -14), (13, -5), (-5, -1)\}$

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 $(-4, 4)$.