.

Functions Ex 3.1 Q1

Function = Let A and B be two non-empty sets. A relation f from A to B, i.e., a sub-set of $A \times B$, is called a function (or a mapping or a map) from A to B, if

(i) for each $a \in A$ there exists $b \in B$ such that $(a, b) \in f$

(ii) $(a, b) \in f$ and $(a, c) \in f \Rightarrow b = c$

If $(a, b) \in f$, then 'b' is called the image of 'a' under f

If a function f is expresed as the set of ordered pairs, the domain f is the set of all first components of members of f and the range of f is the set of second components of members of f.

Functions Ex 3.1 Q2

Function = Let A and B be two non-empty sets. Then a function 'f' from set A to set B is a rule or method or correspondence which associates elements of set A to elements of set b such that:

(i) all elements of set A are associated to element in set B.

(ii) an element of se A is associated to a unique element in set B.

In other words, a function 'f' from a set A to set B associates each element of set A to a unique element of set b.

Functions Ex 3.1 Q3

Function is a type of relation. But in a function no two ordered pairs have the same first element. For eg: R_1 and R_2 are two relations.

Clearly, R_1 is a function, but R_2 is not a function because two ordered pairs $(1, 2)$ and $(1, 4)$ have the same first element.

This means every function is a relation but every relation is not a function.

Functions Ex 3.1 Q4

We have,

$$f(x) = x^2 - 2x - 3$$

Now,

$$f(-2) = (-2)^2 - 2(-2) - 3$$
$$= 4 + 4 - 3$$
$$= 5$$
$$f(-1) = (-1)^2 - 2(-1) - 3$$
$$= 1 + 2 - 3$$
$$= 0$$
$$f(-0) = (-0)^2 - 2 \times 0 - 3$$
$$= -3$$
$$f(1) = (1)^2 - 2 \times 1 - 3$$
$$= 1 - 2 - 3$$
$$= -4$$
$$f(2) = (2)^2 - 2 \times 2 - 3$$
$$= 4 - 4 - 3$$
$$= -3$$

(a) $\text{Rang}(f) = \{-4, -3, 0, 5\}$

(b) Clearly, pre-images of $6, -3$ and 5 is ϕ, $\{0,2\}, -2$ respectively.

********** END **********