



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 expressed 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 set 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,

$$\begin{aligned} f(-2) &= (-2)^2 - 2(-2) - 3 \\ &= 4 + 4 - 3 \\ &= 5 \end{aligned}$$

$$\begin{aligned} f(-1) &= (-1)^2 - 2(-1) - 3 \\ &= 1 + 2 - 3 \\ &= 0 \end{aligned}$$

$$\begin{aligned} f(0) &= (0)^2 - 2 \times 0 - 3 \\ &= -3 \end{aligned}$$

$$\begin{aligned} f(1) &= (1)^2 - 2 \times 1 - 3 \\ &= 1 - 2 - 3 \\ &= -4 \end{aligned}$$

$$\begin{aligned} f(2) &= (2)^2 - 2 \times 2 - 3 \\ &= 4 - 4 - 3 \\ &= -3 \end{aligned}$$

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

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

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