MATHS CLASS XII (Relations and Functions) Continuation.....

General direction for the students :-Whatever be the notes provided , everything must be copied in the Maths Copy and then do the Home work in the same Copy.

FUNCTION:-

A relation from a set 'A' to 'B' is said to be a function , if all the elements 'A' must have a unique image in 'B'.

So function is a subset of Relation. Here the elements of 'A' is known as Domain (D_f) of the function and the corresponding images in 'B' is known as Range (R_f) of the function . All the elements of 'B' is known as Codomain of the function.

Most of the time the function may be given as in the form an equation $y = f(x)$. Here the values of x in which $f(x)$ is defined is known as its Domain and the corresponding values of y is known as Range.

Exercise 1.2

Q7). Given $f(x) = 2x^2 + 3 \quad , x \in R$

i) Image of -1 is $f(-1) = 2.(-1)^2 + 3$

$= 5$ Ans.

ii) A/Q , $2x^2 + 3 = 35$

$\Rightarrow x = \pm 4$ Ans.

Q11 iv). Find the domain of the real function , $f(x) = \frac{1}{\sqrt{3-x}}$.

Clearly $f(x) is\ defined$, $when\ 3 - x > 0 \ \ \forall\ x \in R$

$\Rightarrow 3 > x$

$D_f = (-\infty, 3\ )$ Ans.

Q12 iii). Find the domain an range of the real function $f(x) = 2 - |x - 1|$

We know that $f(x)$ is defined for all $x \in R$

$\Rightarrow D_f = R$ Ans.

We know that , $|x - 1| \geq 0 \quad \forall\ x \in R$

$\Rightarrow -|x - 1| \leq 0$

$\Rightarrow 2 - |x - 1| \leq 0 + 2$

$\Rightarrow f(x) \leq 2$

$\Rightarrow y \leq 2$

$R_f = (-\infty, 2]$ Ans.

Q16 iii). Find the domain and range of the real function $f(x) = \frac{x+1}{2x+1}$

Clearly $f(x)$ *is defined when* $2x + 1 \neq 0$

$if\ 2x + 1 = 0 \quad \Rightarrow x = -\frac{1}{2}$

$\Rightarrow D_f = R - \{-\frac{1}{2}\}$ Ans.

For Range , Given $y = \frac{x+1}{2x+1}$

$\Rightarrow \quad 2xy + y = x + 1$

$\Rightarrow x(2y - 1) = 1 - y$

$\Rightarrow x = \frac{1-y}{2y-1}$

We know that x *is a real number* $\Rightarrow 2y - 1 \neq 0 \quad \Rightarrow y \neq \frac{1}{2}$

$\Rightarrow R_f = R - \left\{\frac{1}{2}\right\}$ Ans.

HOME WORK: Exercise 1.2 , Left over Questions from 1to 16.