Functions Ex 3.1 Q15

We have,

$f(n)$ = the highest prime factor of n.

Now,

$9 = 3 \times 3,$

$10 = 5 \times 2,$

$11 = 11 \times 1,$

$12 = 3 \times 4,$

$13 = 13 \times 1$

$\therefore \quad f = \{(9,3),\ (10,5),\ (11,11),\ (12,3),\ (13,13)\}$

Clearly, range $(f) = \{3,5,11,13\}$

Functions Ex 3.1 Q16

We have,

$$f(x) = \begin{cases} x^2, & 0 \le x \le 3 \\ 3x, & 3 \le x \le 10 \end{cases}$$

and, $$g(x) = \begin{cases} x^2, & 0 \le x \le 2 \\ 3x, & 2 \le x \le 10 \end{cases}$$

Now, $f(3) = (3)^2 = 9$ and $f(3) = 3 \times 3 = 9$

and, $g(2) = (2)^2 = 4$ and $g(2) = 3 \times 2 = 6$

We observe that $f(x)$ takes unique value at each point in its domain $[0,10]$. However $g(x)$ does not takes unique value at each point in its domain $[0,10]$.

Hence, $g(x)$ is not a function.

Functions Ex 3.1 Q17

Given $f(x) = x^2$

$$f(1.1) = 1.21$$
$$f(1) = 1$$
$$\frac{f(1.1) - f(1)}{(1.1) - 1} = \frac{1.21 - 1}{1.1 - 1}$$
$$= \frac{0.21}{0.1}$$
$$= 2.1$$

Functions Ex 3.1 Q18

$f : X \to R$ given by $f(x) = x^3 + 1$

$f(-1) = (-1)^3 + 1 = -1 + 1 = 0$

$f(0) = (0)^3 + 1 = 0 + 1 = 1$

$f(3) = (3)^3 + 1 = 27 + 1 = 28$

$f(9) = (9)^3 + 1 = 81 + 1 = 82$

$f(7) = (7)^3 + 1 = 343 + 1 = 344$

Set of ordered pairs are $\{(-1,0),(0,1),(3,28),(9,82),(7,344)\}$

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