12/09/XX Class-XI^{sc} (MATHS) K. Kanhaiya

Topic :- Relation and Function

1) If $f(x) = x^2$.

Find $\frac{f(1.1) - f(1)}{(1.1 - 1)}$

Ans → $\frac{(1.1)^2 - 1^2}{1.1 - 1}$

$= \frac{(1.1+1)(1.1-1)}{0.1}$

$= \frac{2.1 \times \cancel{0.1}}{\cancel{0.1}} = 2.1$

2) The relation f is defined by

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

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

Show that f is a function and g is not a function

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Ans→ The function f ~~is~~ has every element has unique image so it is a function but for the function 'g'.

for $x = 2$

$g(2) = 2^2 = 4$

$g(2) = 3 \times 2 = 6$

∴ At $x = 2$, the $g(x)$ has different image so it is not a function.

Do yourself :-

(3)

a) Find the domain and range of the function 'f' defined by $f(x) = \sqrt{x-1}$.

b) Find the domain and range of the function 'f' defined by $f(x) = |x-1|$.

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