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Topic :- Functions.

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Keep it up

Q1. Given $f(x) = (x-1)(x-2)(x-3)$ find a] $f(1)$ b] $f(2)$ c] $f(3)$ d] $f(0)$.

→

$f(x) = (x-1)(x-2)(x-3)$

1] $f(1) = (1-1)(1-2)(1-3)$
$= (0)(-1)(-2)$
$= 0$

2] $f(2) = (2-1)(2-2)(2-3)$
$= (1)(0)(-1)$
$= 0$.

3] $f(3) = (3-1)(3-2)(3-3)$
$= (2)(1)(0)$
$= 0$.

4] $f(0) = (0-1)(0-2)(0-3)$
$= (-1)(-2)(-3)$
$= -6$.

Q2. Solve following functions.

If $f(m) = m^2 - 3m + 1$, find

a] $f(0)$ ... b] $f(-3)$

c] $f(\frac{1}{2})$ d] $f(x+1)$ e] $f(-x)$

→

$f(m) = m^2 - 3m + 1$.

1] $f(0) = (0)^2 - 3(0) + 1$

$= 0 - 0 + 1$

$\therefore f(0) = 1$

2] $f(-3) = (-3)^2 - 3(-3) + 1$

$= 9 + 9 + 1$

$= 18 + 1$

$\therefore f(-3) = 19$.

3] $f(\frac{1}{2}) = (\frac{1}{2})^2 - 3(\frac{1}{2}) + 1$

$= \frac{1}{4} - \frac{3}{2} + 1$

$= \frac{2 - 12 + 1}{8}$

$= \frac{-10}{8} + 1$

$= \frac{-2}{8}\frac{1}{4}$

$= \frac{-1}{4} = -0.25$.

$\therefore f(\frac{1}{2}) = -0.25$.

4] $f(x+1) = (x+1)^2 - 3(x+1)+1$.

$= x^2 + 2x + 1 - 3x - 3 + 1$

$= x^2 + 2x - 3x + 2$

$\therefore f(x+1) = x^2 - x + 2$.

5] $f(-x) = (-x)^2 - 3(-x) + 1$

$= x^2 + 3x + 1$

$\therefore f(-x) = x^2 + 3x + 1$.

Q3. Solu.

If $f(x) = \begin{cases} x^2+3, & x \leq 2 \\ 5x+1, & x > 2 \end{cases}$, then find

a] $f(3)$ b] $f(2)$ c] $f(6)$

→

~~a] $f(3) =$~~

$\nexists$

a] $f(3)$:-

$f(x) = 5x + 1$

$f(3) = 5(3) + 1$

$= 15 + 1$.

$\therefore f(3) = 22$

b] $f(2)$:-

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

$f(2) = (2)^2 + 3$

$= 4 + 3$

$\therefore f(2) = 7$.

c] $f(0)$:-

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

$f(0) = (0)^2 + 3$

$= 0 + 3$

$\therefore f(0) = 3.$

Q4. Solve

1] If $f(x) = \frac{2x-1}{5x-2}$, $x \neq \frac{2}{5}$

Verify whether $(fof)(x) = x$.

→

$$fof = f(f) = \frac{2\left(\frac{2x-1}{5x-2}\right) - 1}{5\left(\frac{2x-1}{5x-2}\right) - 2}$$

$$= \frac{\frac{4x-2-(5x-2)}{5x-2}}{\frac{10x-5-(10x-4)}{5x-2}}$$

$$= \frac{4x-2-5x+2}{10x-5-10x+4}$$

$$= \frac{-x}{+1}$$

$= x$ is hence verified.