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Std - 11

Sub - MATH - I

Q.1 Given $F(x) = (x-1)(x-2)(x-3)$

Find (a) $F(1)$, (b) $F(2)$, (c) $F(3)$, (d) $F(0)$

Ans $F(1) = (1-1)(1-2)(1-3) = (0)(-1)(-2) = 0$

$$F(2) = (2-1)(2-2)(2-3) = (1)(0)(-1) = 0$$

$$F(3) = (3-1)(3-2)(3-3) = (2)(1)(0) = 0$$

$$F(0) = (0-1)(0-2)(0-3) = (-1)(-2)(-3) = -6$$

Q.2 Solve following function.

If $F(m) = m^2 - 3m + 1$, Find....

Ans a) $F(0) = (0)^2 - 3(0) + 1$
 $= 0 - 0 + 1$

$$F(0) = 1$$

b) $F(-3) = (-3)^2 - 3(-3) + 1$
 $= 9 + 9 + 1$
 $= 19$

c) $F\left[\frac{1}{2}\right] = \left[\frac{1}{2}\right]^2 - 3\left[\frac{1}{2}\right] + 1$

$$= \frac{1}{4} - \frac{3}{2} + 1 = \frac{2-12}{8} + 1$$

$$= \frac{-10}{8} + 1 = \frac{-10+8}{8} = \frac{-2}{8} = \frac{1}{4} = 0.25$$

d) $F(2x+1) = (2x+1)^2 - 3(2x+1) + 1$
 $= 2x^2 + 22x + 1 - 32x - 3 + 1$
 $= 2x^2 - 2x + 2$

e) $F(-2x) = (-2x)^2 - 3(-2x) + 1$
 $= 2x^2 + 32x + 1$

Q.3 Solve

$$\text{IF } f(x) = \begin{cases} x^2 + 3, & x \leq 2 \\ 5x + 7, & x > 2 \end{cases}, \text{ then find}$$

(a) $f(3)$ (b) $f(2)$ (c) $f(0)$

Ans (a) $f(3)$

$$f(x) = 5x + 7$$

$$f(3) = 5(3) + 7 = 22$$

(b) $f(2)$

$$f(x) = x^2 + 3 = (2)^2 + 3 = 7$$

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

Q.4 Solve

$$\text{IF } f(x) = \frac{2x-1}{5x-2}, \quad x \neq \frac{2}{5}$$

Verify whether $(f \circ f)(x) = x$

Ans $f \circ f = f(f) = \frac{2f-1}{5f-2} = \frac{2\left[\frac{2x-1}{5x-2}\right] - 1}{5\left[\frac{2x-1}{5x-2}\right] - 2}$

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

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

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

$$= x \rightarrow \text{Hence verified}$$