STD – 9 MATHS

CHAPTER - 2

polynomials

EXERCISE - 2.2 Q : 3,4

3. Verify whether the following are zeroes of the polynomial, indicated against them.

(i) $p(x) = 3x + 1, x = \frac{-1}{3}$

For, $x = \frac{-1}{3}$, $p(x) = 3x + 1$

$\therefore p(\frac{-1}{3}) = 3(\frac{-1}{3}) + 1 = -1 + 1 = 0$

$\therefore \frac{-1}{3}$ is a zero of p(x).

(ii) $p(x) = 5x - 1, x = \frac{4}{5}$

For, $x = \frac{4}{5}$, $p(x) = 5x - \pi$

$\therefore p(\frac{4}{5}) = 5(\frac{4}{5}) - \pi$

$= 4 - \pi$

$\therefore \frac{4}{5}$ is not a zero of $p(x)$

(iii) $p(x) = x^2 - 1, x = 1, -1$

For, $x = 1, -1$

$p(x) = x^2 - 1$

$p(1) = 1^2 - 1$

$= 1 - 1 = 0$

$p(-1) = (-1)^2 - 1$

$= 1 - 1 = 0$

$\therefore$ 1, -1 are zeros of p(x).

(iv) $p(x) = (x + 1)(x - 2)$, $x = -1, 2$

For, $x = -1, 2$;

$p(x) = (x + 1)(x - 2)$

$p(-1) = (-1 + 1)(-1 - 2)$

$= (0)(-3)$

$= 0$

$p(2) = (2 + 1)(2 - 2)$

$= (3)(0) = 0$

$\therefore$ -1,2 are zeros of p(x).

(v) $p(x) = x^2$, $x = 0$

For, $x = 0$ $p(x) = x^2$

$p(0) = 0^2$

$= 0$

$\therefore$ 0 is a zero of $p(x)$.

(vi) $p(x) = lx + m, x = \frac{-m}{l}$

For, $x = \frac{-m}{l}$; $p(x) = lx + m$

$\therefore p\left(\frac{-m}{l}\right) = l\left(\frac{-m}{l}\right) + m$

$= -m + m$

$= 0$

$\therefore \frac{-m}{l}$ is a zero of p(x).

(vii) $p(x) = 3x^2 - 1$, $x = \frac{-1}{\sqrt{3}}, \frac{2}{\sqrt{3}}$

For, $x = \frac{-1}{\sqrt{3}}, \frac{2}{\sqrt{3}}$; $p(x) = 3x^2 - 1$

$\therefore p(\frac{-1}{\sqrt{3}}) = 3(\frac{-1}{\sqrt{3}})^2 - 1$

$= 3(\frac{1}{3}) - 1$

$= -1 - 1 \qquad = 0$

$\therefore p(\frac{2}{\sqrt{3}}) = 3(\frac{2}{\sqrt{3}})^2 - 1$

$= 3(\frac{4}{3}) - 1 = 4 - 1$

$= 3 \neq 0$

$\therefore \frac{-1}{\sqrt{3}}$ is a zero of p(x) but $\frac{2}{\sqrt{3}}$ is not a zero of p(x).

(viii) $p(x) = 2x + 1, x = \frac{1}{2}$

For, $x = \frac{1}{2}$ $p(x) = 2x + 1$

$\therefore p(\frac{1}{2}) = 2(\frac{1}{2}) + 1$

$= 1 + 1$

$= 2 \neq 0$

$\therefore$ $\frac{1}{2}$ is not a zero of p(x).

4. Find the zero of the polynomials in each of the following cases:

(i) $p(x) = x + 5$

$p(x) = x + 5$

$\Rightarrow x + 5 = 0$

$\Rightarrow x = -5$

$\therefore$ 5 is a zero polynomial of the polynomial p(x).

(ii) $p(x) = x - 5$

$p(x) = x - 5$

$\Rightarrow x - 5 = 0$

$\Rightarrow x = 5$

$\therefore$ 5 is a zero polynomial of the polynomial p(x).

(iii) $p(x) = 2x + 5$

$p(x) = 2x + 5$

$\Rightarrow 2x + 5 = 0$

$\Rightarrow 2x = -5$

$\Rightarrow x = \frac{-5}{2}$

$\therefore x = \frac{-5}{2}$ is a zero polynomial of the polynomial p(x).

(iv) $p(x) = 3x - 2$

$p(x) = 3x - 2$

$\Rightarrow 3x - 2 = 0$

$\Rightarrow 3x = 2$

$\Rightarrow x = \frac{2}{3}$

$\therefore x = \frac{2}{3}$ is a zero polynomial of the polynomial p(x).

(v) $p(x) = 3x$

$p(x) = 3x$

$\Rightarrow 3x = 0$

$\Rightarrow x = 0$

$\therefore$ 0 is a zero polynomial of the polynomial p(x).

(vi) $p(x) = ax,\ a \neq 0$

$p(x) = ax$

$\Rightarrow 3x = 0$

$\Rightarrow x = 0$

$\therefore x = 0$ is a zero polynomial of the polynomial $p(x)$.

(vii) $p(x) = cx + d$, $c \neq 0$, c, d are real numbers.

$$p(x) = cx + d$$

$$\Rightarrow cx + d = 0$$

$$\Rightarrow x = \frac{-d}{c}$$

$$\therefore x = \frac{-d}{c} \text{ is a zero polynomial of the polynomial } p(x).$$

Thanks

For watching