STD – 9 MATHS

CHAPTER - 2

polynomials

EXERCISE - 2.4 Q : 5(1,2)

5. Factorize:

(i) $x^3 - 2x^2 - x + 2$

➢ Let $p(x) = x^2 - 2x^2 - x + 2$

Factors of 2 are ±1 and ± 2

Now,

$p(x) = x^3 - 2x^2 - x + 2$

$p(-1) = (-1)^3 - 2(-1)^2 - (-1) + 2$

$= - 1 - 2 + 1 + 2$

$= 0$

Therefore, (x + 1) is the factor of p(x)

$$
\begin{array}{r|l}
x + 1 & x^2 - 3x + 2 \\
\hline
 & x^3 - 2x^2 - x + 2 \\
 & \underline{-\,x^3 - x^2} \\
 & \quad -3x^2 - x + 2 \\
 & \quad \underline{-\,3x^2 - 3x} \\
 & \quad\quad 2x + 2 \\
 & \quad\quad \underline{-\,2x - 2} \\
 & \quad\quad\quad 0
\end{array}
$$

Now, Dividend = Divisor × Quotient + Remainder

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

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

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

(ii) $x^3 - 3x^2 - 9x - 5$

➢ Let $p(x) = x^3 - 3x^2 - 9x - 5$

Factors of 5 are ±1 and ±5

By trial method, we find that

$p(5) = 0$

So, $(x - 5)$ is factor of $p(x)$

Now,

$$p(x) = x^3 - 3x^2 - 9x - 5$$

$$p(5) = (5)^3 - 3(5)^2 - 9(5) - 5$$

$$= 125 - 75 - 45 - 5$$

$$= 0$$

Therefore, (x - 5) is the factor of p(x)

$$x - 5 \overline{)\, x^2 + 2x + 1 \;\; \big| \;\; x^2 - 3x^2 - 9x - 5}$$

$$x^3 - 5x^2$$

$$-\quad +$$

$$2x^2 - 9x - 5$$

$$2x^2 - 10x$$

$$-\quad +$$

$$x - 5$$

$$x - 5$$

$$-\quad +$$

$$0$$

Now, Dividend = Divisor x Quotient + Remainder

$= (x - 5)(x^2 + 2x + 1) = (x - 5)(x^2 + x + x + 1)$

$= (x - 5)(x(x + 1) + 1(x + 1))$

$= (x - 5)(x + 1)(x + 1)$

Thanks

For watching