

STD – 9

MATHS

CHAPTER - 2

polynomials

EXERCISE - 2.4 Q : 3,4

3. Find the value of k, if $x - 1$ is a factor of $p(x)$ in each of the following cases:

(i) $p(x) = x^2 + x + k$

➤ If $x - 1$ is a factor of $p(x)$, then $p(1) = 0$

By Factor Theorem

$$\Rightarrow (1)^2 + (1) + k = 0$$

$$\Rightarrow 1 + 1 + k = 0$$

$$\Rightarrow 2 + k = 0$$

$$\Rightarrow k = -2$$

(ii) $p(x) = 2x^2 + kx + \sqrt{2}$

➤ If $x - 1$ is a factor of $p(x)$, then $p(1) = 0$

$$\Rightarrow 2(1)^2 + k(1) + \sqrt{2} = 0$$

$$\Rightarrow 2 + k + \sqrt{2} = 0$$

$$\Rightarrow k = -(2 + \sqrt{2})$$

(iii) $p(x) = kx^2 - \sqrt{2}x + 1$

➤ If $x - 1$ is a factor of $p(x)$, then $p(1) = 0$

By Factor Theorem

$$\Rightarrow k(1)^2 - \sqrt{2}(1) + 1 = 0$$

$$\Rightarrow k = \sqrt{2} - 1$$

(iv) $p(x) = kx^2 - 3x + k$

➤ If $x-1$ is a factor of $p(x)$, then $p(1) = 0$

By Factor Theorem

$$K(1)^2 - 3(1) + k = 0$$

$$\Rightarrow k - 3 + k = 0$$

$$\Rightarrow 2k - 3 = 0$$

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

4. Factorize:

(i) $12x^2 - 7x + 1$

- **Using the splitting the middle term method,**
- **We have to find a number whose sum = -7 and product = $1 \times 12 = 12$**
- **We get -3 and -4 as the numbers**
 $[-3 + -4 = -7 \text{ and } -3 \times -4 = 12]$

$$= 12x^2 - 7x - 1 = 12x^2 - 4x - 3x + 1$$

$$= 4x(3x - 1) - 1(3x - 1)$$

$$= (4x - 1)(3x - 1)$$

(ii) $2x^2 + 7x + 3$

➤ **Using the splitting the middle term method,**

**We have to find a number whose sum = 7 and product
= $2 \times 3 = 6$**

➤ **We get 6 and 1 as the numbers**

[$6 + 1 = 7$ and $6 \times 1 = 6$]

$$2x^2 + 7x + 3 = 2x^2 + 6x + 1x + 3$$

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

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

(iii) $6x^2 + 5x - 6$

- **Using the splitting the middle term method,**
- **We have to find a number whose sum= 5 and product
= $6x - 6 = -36$**
- **We get -4 and 9 as the numbers
[$-4 + 9 = 5$ and $-4 \times 9 = -36$]
 $6x^2 + 5x - 6 = 6x^2 + 9x - 4x - 6$
 $= 3x(2x + 3) - 2(2x + 3)$
 $= (2x + 3)(3x - 2)$**

(iv) $3x^2 - x - 4$

- **Using the splitting the middle term method,**
- **We have to find a number whose sum= - 1 and product
= $3x - 4 = -12$**
- **We get -4 and 3 as the numbers
[$-4 + 3 = -1$ and $-4 \times 3 = -12$]
 $3x^2 - x - 4 = 3x^2 - 4x + 3x - 4$
 $= x(3x - 4) + 1(3x - 4)$
 $= (3x - 4)(x + 1)$**

Thanks



For watching