Section A

1. When $2x^3 - x^2 - 3x + 5$ is divided by $2x + 1$, then the remainder is

   (a) 6

   (b) -6

   (c) -3

   (d) 0

2. If on dividing $4x^2 - 3kx + 5$ by $x + 2$, the remainder is -3 then the value of k is

   (a) 4

   (b) -4

   (c) 3

   (d) -3

3. If on dividing $2x^3 + 6x^2 - (2k - 7)x + 5$ by $x + 3$, the remainder is $k - 1$ then the value of k is

   (a) 2

   (b) -2

   (c) -3

   (d) 3

4. If $x + 1$ is a factor of $3x^3 + kx^2 + 7x + 4$, then the value of k is

   (a) -1

   (b) 0

   (c) 6

   (d) 10

Section B

(a) Find the remainder when $2x^3 - 3x^2 + 4x + 7$ is divided by:

   i. $x - 2$

   ii. $x + 3$

   iii. $2x + 1$

(b) When $2x^3 - 9x^2 + 10x - p$ is divided by $(x + 1)$, the remainder is -24. Find the value of p.

(c) If $(2x - 3)$ is a factor of $6x^2 + x + a$, find the value of a. With this value of a, factorise the given expression.

(d) When $3x^2 - 5x + p$ is divided by $(x - 2)$, the remainder is 3. Find the value of p. Also, factorise the polynomial $3x^2 - 5x + p - 3$.

(e) Prove that $(5x + 4)$ is a factor of $5x^3 + 4x^2 - 5x - 4$. Hence, factorise the given polynomial completely.

(f) Use the factor theorem to factorise the following polynomials completely:

   i. $4x^3 + 4x^2 - 9x - 9$

   ii. $x^3 - 19x - 30$

(g) If $x^3 - 2x^2 + px + q$ has a factor $(x + 2)$ and leaves a remainder 9 when divided by $(x + 1)$, find the values of p and q. With these values of p and q, factorise the given polynomial completely.

(h) If $(x + 3)$ and $(x - 4)$ are factors of $x^3 + ax^2 - bx + 24$, find the values of a and b. With these values of a and b, factorise the given expression.

(i) If $(2x + 1)$ is a factor of both the expressions $2x^2 - 5x + p$ and $2x^2 + 5x + q$, find the values of p and q. Hence, find the other factors of both the polynomials.

(j) If a polynomial $f(x) = x^4 - 2x^3 + 3x^2 - ax - b$ leaves remainders 5 and 19 when divided by $(x - 1)$ and $(x + 1)$, find the values of a and b. Hence, determine the remainder when $f(x)$ is divided by $(x - 2)$.

(k) When a polynomial $f(x)$ is divided by $(x - 1)$, the remainder is 5, and when it is divided by $(x - 2)$, the remainder is 7. Find the remainder when it is divided by $(x - 1)(x - 2)$.

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