



Factorisation of Polynomials Ex 6.3 Q6

Answer :

Let us denote the given polynomials as

$$f(x) = x^4 - 3x^2 + 4,$$

$$g(x) = x - 2$$

We have to find the remainder when $f(x)$ is divided by $g(x)$.

By the remainder theorem, when $f(x)$ is divided by $g(x)$ the remainder is

$$\begin{aligned} f(2) &= (2)^4 - 3(2)^2 + 4 \\ &= 16 - 12 + 4 \\ &= \boxed{8} \end{aligned}$$

We will calculate remainder by actual division

$$\begin{array}{r} x^3 + 2x^2 + x + 2 \\ x-2 \overline{) x^4 - 3x^2 + 4} \\ \underline{x^4 - 2x^3} \\ - + \\ 2x^3 - 3x^2 + 4 \\ \underline{2x^3 - 4x^2} \\ + \\ x^2 + 4 \\ \underline{x^2 - 2x} \\ - + \\ \underline{2x + 4} \\ 2x - 4 \\ \underline{- } \\ 8 \end{array}$$

So the remainder is 8

Factorisation of Polynomials Ex 6.3 Q7

Answer :

Let us denote the given polynomials as

$$f(x) = 9x^3 - 3x^2 + x - 5,$$

$$g(x) = x - \frac{2}{3}$$

We have to find the remainder when $f(x)$ is divided by $g(x)$.

By the remainder theorem, when $f(x)$ is divided by $g(x)$ the remainder is

$$\begin{aligned} f\left(\frac{2}{3}\right) &= 9\left(\frac{2}{3}\right)^3 - 3\left(\frac{2}{3}\right)^2 + \left(\frac{2}{3}\right) - 5 \\ &= 9 \times \frac{8}{27} - 3 \times \frac{4}{9} + \frac{2}{3} - 5 \\ &= \frac{8}{3} - \frac{4}{3} + \frac{2}{3} - 5 \\ &= \boxed{-3} \end{aligned}$$

Remainder by actual division

$$\begin{array}{r} \phantom{x - \frac{2}{3}} \overline{9x^2 + 3x + 3} \\ x - \frac{2}{3} \overline{) 9x^3 - 3x^2 + x - 5} \\ \underline{9x^3 - 6x^2} \\ 3x^2 + x - 5 \\ \underline{3x^2 - 2x} \\ 3x - 5 \\ \underline{3x - 2} \\ -3 \end{array}$$

Remainder is -3

***** END *****