Factorisation of Polynomials Ex 6.3 Q1

Answer :

Let us denote the given polynomials as

$$f(x)=x^3+4x^2-3x+10,$$
$$g(x)=x+4$$
$$\Rightarrow \quad g(x)=x-(-4)$$

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

$$f(-4)=(-4)^3+4(-4)^2-3(-4)+10$$
$$=-64+64+12+10$$
$$=\boxed{22}$$

Now we will show by actual division

$$\begin{array}{r|l} & x^2-3 \\ \hline x+4 & x^3+4x^2-3x+10 \\ & x^3+4x^2 \\ & - \quad - \\ \hline & \quad -3x+10 \\ & \quad -3x-12 \\ & \quad + \quad + \\ \hline & \qquad 22 \end{array}$$

So the remainder by actual division is 22

Factorisation of Polynomials Ex 6.3 Q2

Answer :

Let us denote the given polynomials as

$$f(x)=4x^4-3x^3-2x^2+x-7$$
$$g(x)=x-1$$

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

$$f(1)=4(1)^4-3(1)^3-2(1)^2+1-7$$
$$=4-3-2+1-7$$
$$=\boxed{-7}$$

Now we will show remainder by actual division

$$\begin{array}{r|l} & 4x^3+x^2-x \\ \hline x-1 & 4x^4-3x^3-2x^2+x-7 \\ & 4x^4-4x^3 \\ & - \quad + \\ \hline & \quad x^3-2x^2+x-7 \\ & \quad x^3-x^2 \\ & \quad - \quad + \\ \hline & \qquad -x^2+x-7 \\ & \qquad -x^2+x \\ & \qquad + \quad - \\ \hline & \qquad\quad -7 \end{array}$$

So the remainder by actual division is -7

Factorisation of Polynomials Ex 6.3 Q3

Answer :

Let us denote the given polynomials as

$$f(x) = 2x^4 - 6x^3 + 2x^2 - x + 2,$$
$$g(x) = x + 2$$
$$\Rightarrow \quad g(x) = x - (-2)$$

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

$$f(-2) = 2(-2)^4 - 6(-2)^3 + 2(-2)^2 - (-2) + 2$$
$$= 32 + 48 + 8 + 2 + 2$$
$$= \boxed{92}$$

Now we will calculate the remainder by actual division

$$\begin{array}{r|l} & 2x^3 - 10x^2 + 22x - 45 \\ \hline x+2 & 2x^4 - 6x^3 + 2x^2 - x + 2 \\ & 2x^4 + 4x^3 \\ & - \quad - \\ \hline & -10^3 + 2x^2 - x + 2 \\ & -10x^3 - 20x^2 \\ & + \quad + \\ \hline & 22x^2 - x + 2 \\ & 22x^2 + 44x \\ & - \quad - \\ \hline & -45x + 2 \\ & -45x - 90 \\ & + \quad + \\ \hline & 92 \end{array}$$

So the remainder by actual division is 92

********** END **********