



Factorisation of Polynomials Ex 6.4 Q4

Answer :

It is given that $f(x) = x^3 - 6x^2 - 19x + 84$ and $g(x) = x - 7$

By the factor theorem, $g(x)$ is the factor of polynomial $f(x)$, if $f(7) = 0$.

Therefore, in order to prove that $(x - 7)$ is a factor of $f(x)$.

It is sufficient to show that $f(7) = 0$

Now,

$$\begin{aligned} f(7) &= (7)^3 - 6(7)^2 - 19(7) + 84 \\ &= 343 - 294 - 133 + 84 \\ &= 427 - 427 \\ &= 0 \end{aligned}$$

Hence, $(x - 7)$ is a factor of polynomial $f(x)$.

Factorisation of Polynomials Ex 6.4 Q5

Answer :

It is given that $f(x) = 3x^3 + x^2 - 20x + 12$ and $g(x) = 3x - 2$

By the factor theorem,

$(3x - 2)$ is the factor of $f(x)$, if $f\left(\frac{2}{3}\right) = 0$.

Therefore,

In order to prove that $(3x - 2)$ is a factor of $f(x)$.

It is sufficient to show that $f\left(\frac{2}{3}\right) = 0$.

Now,

$$\begin{aligned} f\left(\frac{2}{3}\right) &= 3\left(\frac{2}{3}\right)^3 + \left(\frac{2}{3}\right)^2 - 20\left(\frac{2}{3}\right) + 12 \\ &= 3\left(\frac{8}{27}\right) + \left(\frac{4}{9}\right) - \frac{40}{3} + 12 \\ &= \frac{8}{9} + \frac{4}{9} - \frac{40}{3} + \frac{12}{1} \\ &= \frac{4}{3} - \frac{40}{3} + \frac{12}{1} \\ &= \frac{4}{3} - \frac{40}{3} + \frac{48}{3} \\ &= \frac{4 - 40 + 48}{3} \\ &= \frac{12}{3} \\ &= 4 \end{aligned}$$

Hence, $(3x - 2)$ is the factor of polynomial $f(x)$.

Factorisation of Polynomials Ex 6.4 Q6

Answer :

It is given that $f(x) = 2x^3 - 9x^2 + x + 12$ and $g(x) = (3 - 2x)$

By factor theorem, $(3 - 2x)$ is the factor of $f(x)$, if $f\left(\frac{3}{2}\right) = 0$

Therefore,

In order to prove that $(3 - 2x)$ is a factor of $f(x)$. It is sufficient to show that $f\left(\frac{3}{2}\right) = 0$

Now,

$$\begin{aligned} f\left(\frac{3}{2}\right) &= 2\left(\frac{3}{2}\right)^3 - 9\left(\frac{3}{2}\right)^2 + \left(\frac{3}{2}\right) + 12 \\ &= \frac{27}{4} - \frac{81}{4} + \frac{3}{2} + 12 \\ &= \frac{\cancel{54}^{27}}{\cancel{4}_2} + \frac{3}{2} + 12 \\ &= -\frac{27}{2} + \frac{3}{2} + 12 \\ &= -12 + 12 \\ &= 0 \end{aligned}$$

Hence, $(3 - 2x)$, is the factor of polynomial $f(x)$.

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