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,

$$\begin{aligned}f\left(\frac{2}{3}\right)&=3\left(\frac{2}{3}\right)^3+\left(\frac{2}{3}\right)^2-20\left(\frac{2}{3}\right)+12\\&=3\left(\frac{8}{27}\right)+\left(\frac{4}{9}\right)-\frac{40}{3}+12\\&=\frac{8}{9}+\frac{4}{9}-\frac{40}{3}+\frac{12}{1}\\&=\frac{4}{}\ \frac{\cancel{12}}{\cancel{9}_{\,3}}-\frac{4}{3}\\&=\frac{4}{3}-\frac{4}{3}\\&=0\end{aligned}$$

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,

$$f\left(\frac{3}{2}\right) = 2\left(\frac{3}{2}\right)^3 - 9\left(\frac{3}{2}\right)^2 + \left(\frac{3}{2}\right) + 12$$

$$= \frac{27}{4} - \frac{81}{4} + \frac{3}{2} + 12$$

$$= \frac{\cancel{54}^{27}}{\cancel{4}_{2}} + \frac{3}{2} + 12$$

$$= -\frac{27}{2} + \frac{3}{2} + 12$$

$$= -12 + 12$$

$$= 0$$

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

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