Factorisation of Polynomials Ex 6.4 Q7

Answer :

It is given that $f(x)=x^3-6x^2+11x-6$ and $g(x)=x^2-3x+2$

We have

$$\begin{aligned} g(x) &= x^2-3x+2 \\ &= x^2-2x-x+2 \\ &= (x-2)(x-1) \end{aligned}$$

⇒x-2 and $(x-1)$ are factor of $g(x)$ by the factor theorem.

To prove that $(x-2)$ and $(x-1)$ are the factor of $f(x)$.

It is sufficient to show that $f(2)$ and $f(1)$ both are equal to zero.

$$\begin{aligned} f(2) &= (2)^3-6(2)^2+11(2)-6 \\ &= 8-24+22-6 \\ &= 30-30 \end{aligned}$$

$$\boxed{f(2)=0}$$

And

$$\begin{aligned} f(1) &= (1)^3-6(1)^2+11(1)-6 \\ &= 1-6+11-6 \\ &= 12-12 \end{aligned}$$

$$\boxed{f(1)=0}$$

Hence, $g(x)$ is the factor of the polynomial $f(x)$.

Factorisation of Polynomials Ex 6.4 Q8

Answer :

Let $f(x)=2^3-3x^2-10x+24$ be the given polynomial.

By factor theorem,

$(x-2),(x+3)$ and $(x-4)$ are the factor of $f(x)$.

If $f(2), f(-3)$ and $f(4)$ are all equal to zero.

Now,

$$\begin{aligned} f(2) &= (2)^3-3(2)^2-10(2)+24 \\ &= 8-12-20+24 \\ &= 32-32 \\ &= 0 \end{aligned}$$

also

$$\begin{aligned} f(-3) &= (-3)^3-3(-3)^2-10(-3)+24 \\ &= -27-27+30+24 \\ &= -54+54 \\ &= 0 \end{aligned}$$

And

$$\begin{aligned} f(4) &= (4)^3-3(4)^2-10(4)+24 \\ &= 64-48-40+24 \\ &= 88-88 \\ &= 0 \end{aligned}$$

Hence, $(x-2),(x+3)$ and $(x-4)$ are the factor of polynomial $f(x)$.

Factorisation of Polynomials Ex 6.4 Q9

Answer :

Let $f(x)=x^3-6x^2-19x+84$ be the given polynomial.

By the factor theorem,

$(x+4),(x-3)$ and $(x-7)$ are the factor of $f(x)$.

If $f(-4), f(3)$ and $f(7)$ are all equal to zero.

Therefore,

$$\begin{aligned} f(-4) &= (-4)^3-6(-4)^2-9(-4)+84 \\ &= -64-96+76+84 \\ &= -160+160 \\ &= 0 \end{aligned}$$

Also

$$\begin{aligned} f(3) &= (3)^3-6(3)^2-19(3)+84 \\ &= 27-54-57+84 \\ &= 111-111 \\ &= 0 \end{aligned}$$

And

$$\begin{aligned} f(7) &= (7)^3-6(7)^2-19(7)+84 \\ &= 243-294-133+84 \\ &= 427-427 \\ &= 0 \end{aligned}$$

Hence, $(x+4),(x-3)$ and $(x-7)$ are the factor of the polynomial $f(x)$.

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