Factorisation of Polynomials Ex 6.2 Q1

Answer :

Let $f(x)=2x^3-13x^2+17x+12$ be the given polynomial

(i) The value of $f(2)$ can be found by putting $x=2$

$$\begin{aligned}f(2)&=2\times(2)^3-13\times(2)^2+17\times2+12\\&=2\times8-13\times4+34+12\\&=2\times8-13\times4+34+12\\&=16-52+34+12\\&=10\end{aligned}$$

(ii) The value of $f(-3)$ can be found by putting $x=-3$

$$\begin{aligned}f(-3)&=2\times(-3)^3-13\times(-3)^2+17\times(-3)+12\\&=2\times(-27)-13\times9+17\times(-3)+12\\&=-54-117-51+12\\&=-210\end{aligned}$$

(iii) The value of $f(0)$ can be found by putting $x=0$

$$\begin{aligned}f(0)&=2\times(0)^3-13\times(0)^2+17\times0+12\\&=0-0+0+12\\&=12\end{aligned}$$

Factorisation of Polynomials Ex 6.2 Q2

Answer :

(i) To check whether the given number is the zero of the polynomial or not we have to find $f\left(-\frac{1}{3}\right)$

$$f(x)=3x+1, x=-\frac{1}{3}$$

$$\begin{aligned}f\left(-\frac{1}{3}\right)&=3\times\left(-\frac{1}{3}\right)+1\\&=-1+1=0\end{aligned}$$

$$f\left(-\frac{1}{3}\right)=0$$

Hence, $x=-\frac{1}{3}$ is the zeros of the given polynomial.

(ii) To check whether the given number is the zero of the polynomial or not we have to find $f(-1)$ and $f(1)$

$$f(x)=x^2-1, x=1, x=-1$$

Now,

$$f(1)=(1)^2-1$$

$$\begin{aligned}f(1)&=1-1\\&=0\end{aligned}$$

And ,

$$f(-1)=(-1)^2-1$$
$$f(-1)=1-1$$
$$=0$$

Hence, $x=-1$ and $x=1$ are the zeros of the polynomial.

(iii) To check whether the given number is the zero of the polynomial or not we have to find

$$g\left(-\frac{2}{\sqrt{3}}\right) \text{ and } g\left(\frac{2}{\sqrt{3}}\right)$$
$$g(x)=3x^2-2, x=\frac{2}{\sqrt{3}}, -\frac{2}{\sqrt{3}}$$

Now,

$$g\left(\frac{2}{\sqrt{3}}\right)=3\left(\frac{2}{\sqrt{3}}\right)^2-2$$
$$=\cancel{3}\times\frac{4}{\cancel{3}}-2=2$$

And

$$g\left(-\frac{2}{\sqrt{3}}\right)=3\times\left(-\frac{2}{\sqrt{3}}\right)^2-2$$
$$=\cancel{3}\times\frac{4}{\cancel{3}}-2=2$$

Here, both the value of $x=\frac{2}{\sqrt{3}}$, $-\frac{2}{\sqrt{3}}$ are not satisfied the polynomial. Therefore, they are not the zeros of the polynomial.

(iv) To check whether the given number is the zero of the polynomial or not we have to find

$$p(1), p(2) \text{ and} p(3)$$
$$p(x)=x^3-6x^2+11x-6$$
$$p(1)=(1)^3-6\times(1)^2+11\times(1)-6$$
$$=1-6\times1+11\times1-6$$
$$=12-12=0$$
$$p(2)=(2)^3-6\times(2)^2+11\times(2)-6$$
$$=8-6\times4+11\times2-6$$
$$=8-24+22-6$$
$$=30-30$$
$$p(2)=0$$

And

$$p(3)=(3)^3-6\times(3)^2+11\times3-6$$
$$=27-6\times9+11\times3-6$$
$$=27-54+33-6$$
$$=60-60$$
$$p(3)=0$$

Hence, $x=1, 2, 3$ are the zeros of the polynomial $p(x)$.

(v)To check whether the given number is the zero of the polynomial or not we have to find $f\left(\frac{4}{5}\right)$

$$f(x)=5x-\pi, x=\frac{4}{5}$$
$$f\left(\frac{4}{5}\right)=\cancel{5}\times\frac{4}{\cancel{5}}-\pi$$
$$=4-\pi$$

Here, $x=\frac{4}{5}$, does not satisfy $f(x)=5x-\pi$, therefore, $x=\frac{4}{5}$ is not a zero of the polynomial.

(vi)To check whether the given number is the zero of the polynomial or not we have to find $f(0)$

$$f(x)=x^2,$$
$$x=0$$
$$f(0)=(0)^2$$
$$=0$$

Hence, $x=0$ is the zeros of the polynomial.

(vii) To check whether the given number is the zero of the polynomial or not we have to find $f\left(-\frac{m}{l}\right)$

$f(x)=lx+m, x=-\frac{m}{l}$

$f\left(-\frac{m}{l}\right)=l\times\left(-\frac{m}{l}\right)+m$

$=-m+m$

$f\left(-\frac{m}{l}\right)=0$

Hence, $x=-m/l$ is zeros of the polynomial.

(viii)To check whether the given number is the zero of the polynomial or not we have to find $f\left(\frac{1}{2}\right)$

$f(x)=2x+1, x=\frac{1}{2}$

$f\left(\frac{1}{2}\right)=2\times\frac{1}{2}+1$

$=1+1$

$f\left(\frac{1}{2}\right)=2$

Hence, $x=\frac{1}{2}$ does not satisyf the polynomial, so, $x=\frac{1}{2}$ is not zero of the polynomial.

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