Factorisation of Polynomials Ex 6.5 Q11

Answer :

Let $f(x)=x^3-10x^2-53x-42$ be the given polynomial.

Now, putting $x=-1$, we get

$$\begin{aligned} f(-1) &= (-1)^3-10(-1)^2-53(-1)-42 \\ &= -1-10+53-42 \\ &= -53+53=0 \end{aligned}$$

Therefore, $(x+1)$ is a factor of polynomial $f(x)$.

Now,

$$\begin{aligned} f(x) &= x^2(x+1)-11x(x+1)-42(x+1) \\ &= (x+1)\{x^2-11x-42\} \\ &= (x+1)\{x^2-14x+3x-42\} \\ &= (x+1)(x+3)(x-14) \end{aligned}$$

Hence $(x+1)$, $(x+3)$ *and* $(x-14)$ are the factors of polynomial f(x).

Factorisation of Polynomials Ex 6.5 Q12

Answer :

Let $f(y)=y^3-2y^2-29y-42$ be the given polynomial.

Now, putting $y=-2$, we get

$$\begin{aligned} f(-2) &= (-2)^3-2(-2)^2-29(-2)-42 \\ &= -8-8+58-42=-58+58 \\ &= 0 \end{aligned}$$

Therefore, $(y+2)$ is a factor of polynomial $f(y)$.

Now,

$$\begin{aligned} f(y) &= y^2(y+2)+4y(y+2)-21(y+2) \\ &= (y+2)\{y^2-4y-21\} \\ &= (y+2)\{y^2-7y+3y-21\} \\ &= (y+2)(y+3)(y-7) \end{aligned}$$

Hence $(y+2),(y+3)$ *and* $(y-7)$ are the factors of polynomial f(y).

Factorisation of Polynomials Ex 6.5 Q13

Answer :

Let $f(y) = 2y^3 - 5y^2 - 19y + 42$ be the given polynomial.

Now, putting $y = 2$, we get

$$\begin{aligned} f(2) &= 2(2)^3 - 5(2)^2 - 19(2) + 42 \\ &= 16 - 20 - 38 + 42 = -58 + 58 \\ &= 0 \end{aligned}$$

Therefore, $(y-2)$ is a factor of polynomial $f(y)$.

Now,

$$\begin{aligned} f(y) &= 2y^2(y-2) - y(y-2) - 21(y-2) \\ &= (y-2)\{2y^2 - y - 21\} \\ &= (y-2)\{2y^2 - 7y + 6y - 21\} \\ &= (y-2)(y+3)(2y-7) \end{aligned}$$

Hence $(y-2)$, $(y+3)$ *and* $(2y-7)$ are the factors of polynomial f(y).

Factorisation of Polynomials Ex 6.5 Q14

Answer :

Let $f(x) = x^3 + 13x^2 + 32x + 20$ be the given polynomial.

Now, putting $x = -1$, we get

$$\begin{aligned} \Rightarrow f(-1) &= (-1)^3 + 13(-1)^2 + 32(-1) + 20 \\ &= -1 + 13 - 32 + 20 = -33 + 33 \\ &= 0 \end{aligned}$$

Therefore, $(x+1)$ is a factor of polynomial $f(x)$.

Now,

$$\begin{aligned} f(x) &= x^2(x+1) + 12x(x+1) + 20(x+1) \\ &= (x+1)\{x^2 + 12x + 20\} \\ &= (x+1)\{x^2 + 10x + 2x + 20\} \\ &= (x+1)(x+2)(x+10) \end{aligned}$$

Hence $(x+1)$, $(x+2)$ *and* $(x+10)$ are the factors of polynomial f(x).

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