Factorisation of Polynomials Ex 6.5 Q15

Answer :

Let $f(x) = x^3 - 3x^2 - 9x - 5$ be the given polynomial.

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

$f(-1) = (-1)^3 - 3(-1)^2 - 9(-1) - 5$

$\qquad = -1 - 3 + 9 - 5 = -9 + 9 = 0$

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

Now,

$f(x) = x^2(x+1) - 4x(x+1) - 5(x+1)$

$\qquad = (x+1)\{x^2 - 4x - 5\}$

$\qquad = (x+1)\{x^2 - 5x + x - 5\}$

$\qquad = (x+1)(x+1)(x-5)$

Hence $(x+1)$, $(x+1)$ *and* $(x-5)$ are the factors of polynomial $f(x)$.

Factorisation of Polynomials Ex 6.5 Q16

Answer :

Let $f(y) = 2y^3 + y^2 - 2y - 1$ be the given polynomial.

Now, putting $y = 1$, we get

$f(1) = 2(1)^3 + (1)^2 - 2(1) - 1 = 2 + 1 - 2 - 1$

$\qquad = 3 - 3 = 0$

Now,

$f(y) = 2y^2(y-1) + 3y(y-1) + 1(y-1)$

$\qquad = (y-1)\{2y^2 + 3y + 1\}$

$\qquad = (y-1)\{2y^2 + 2y + y + 1\}$

$\qquad = (y-1)(2y+1)(y+1)$

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

Factorisation of Polynomials Ex 6.5 Q17

Answer :

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

Now, putting $x = 1$, we get

$$f(1) = (1)^3 - 2(1)^2 - (1) + 2$$
$$= 1 - 2 - 1 + 2 = 3 - 3$$
$$= 0$$

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

Now,

$$f(x) = x^2(x-1) - x(x-1) - 2(x-1)$$
$$= (x-1)\{x^2 - x - 2\}$$
$$= (x-1)\{x^2 - 2x + x - 2\}$$
$$= (x-1)(x+1)(x-2)$$

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

Factorisation of Polynomials Ex 6.5 Q18

Answer :

(i) Let $f(x) = x^3 + 13x^2 + 31x - 45$ be the given polynomial.

Therefore $(x+9)$ is a factor of the polynomial $f(x)$.

Now,

$$f(x) = x^2(x+9) + 4x(x+9) - 5(x+9)$$
$$= (x+9)\{x^2 + 4x - 5\}$$
$$= (x+9)\{x^2 + 5x - x - 5\}$$
$$= (x+9)(x-1)(x+5)$$

Hence $(x-1), (x+5)$ and $(x+9)$ are the factors of polynomial $f(x)$.

(ii) Let $f(x) = 4x^3 + 20x^2 + 33x + 18$ be the given polynomial.

Therefore $(2x+3)$ is a factor of the polynomial $f(x)$.

Now,

$$f(x) = 2x^2(2x+3) + 7x(2x+3) + 6(2x+3)$$
$$= (2x+3)\{2x^2 + 7x + 6\}$$
$$= (2x+3)\{2x^2 + 4x + 3x + 6\}$$
$$= (2x+3)(2x+3)(x+2)$$

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

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