



Factorisation of Polynomials Ex 6.2 Q5

**Answer :**

The given polynomial is

$$f(x) = 2x^3 - 3x^2 + ax + b$$

If  $x = 0$  is zeros of the polynomial  $f(x)$ , then  $f(0) = 0$

$$2 \times (0)^3 - 3 \times (0)^2 + a \times 0 + b = 0$$

$$0 - 0 + 0 + b = 0$$

$$\boxed{b = 0} \quad \dots\dots(1)$$

Similarly, if  $x = -1$  is the zeros of the polynomial of  $f(x)$ ,

Then,  $f(-1) = 0$

$$2 \times (-1)^3 - 3 \times (-1)^2 + a \times (-1) + b = 0$$

$$-2 - 3 - a + b = 0$$

$$-5 - a + b = 0$$

Putting the value of  $b$  from equation (1)

$$-5 - a + 0 = 0$$

$$\boxed{a = -5}$$

Thus,

$$\boxed{a = -5, \\ b = 0}$$

Factorisation of Polynomials Ex 6.2 Q6

**Answer :**

The given polynomial is

$$f(x) = x^3 + 6x^2 + 11x + 6$$

Here,  $f(x)$  is a polynomial with integer coefficient and the coefficient of highest degree term is 1. So, the integer roots of  $f(x)$  are factors of 6. Which are  $\pm 1, \pm 2, \pm 3, \pm 6$  by observing.

$$f(-1) = (-1)^3 + 6 \times (-1)^2 + 11(-1) + 6$$

$$= -1 + 6 - 11 + 6$$

$$= -12 + 12$$

$$= 0$$

Also,

$$f(-2) = (-2)^3 + 6(-2)^2 + 11(-2) + 6$$

$$= -8 + 6 \times 4 - 22 + 6$$

$$= -8 + 24 - 22 + 6$$

$$= 30 - 30$$

$$= 0$$

And similarly,

$$f(-3) = 0$$

Therefore, the integer roots of the polynomial  $f(x)$  are  $-1, -2, -3$

Factorisation of Polynomials Ex 6.2 Q7

**Answer :**

The given polynomial is

$$f(x) = 2x^3 + x^2 - 7x - 6$$

$f(x)$  is a cubic polynomial with integer coefficients. If  $bc$  is rational root in lowest terms, then the values of  $b$  are limited

to the factors of 6 which are  $\pm 1, \pm 2, \pm 3, \pm 6$  and the values of  $c$  are limited to the factor of 2 as  $\pm 1, \pm 2$ .

Hence, the possible

rational roots are  $\pm 1, \pm 2, \pm 3, \pm 6, \pm 12, \pm 32$ .

Since,  $f(2) = 2 \cdot 2^3 + 2^2 - 7 \cdot 2 - 6 = 0$

So, 2 is a root of the polynomial  $f(x) = 2x^3 + x^2 - 7x - 6$

Now, the polynomial can be written as,

$$f(x) = (x - 2)(2x^2 + 5x + 3)$$

Also,

$$f(-1) = (-1 - 2)(2 - 5 + 3) = 0$$

Therefore,

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

Hence, the rational roots of the polynomial  $f(x) = 2x^3 + x^2 - 7x - 6$  are 2,  $-3/2$  and  $-1$ .

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