

Mathematics

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(Chapter – 2) (Polynomials)(Exemplar Problems)

(Class – X)

Exercise 2.3

Find the zeroes of the following polynomials by factorization method and verify the relations between the zeroes and the coefficients of the polynomials.

Question 5:

$$2x^2 + \frac{7}{2}x + \frac{3}{4}$$

Answer 5:

$$\text{Let } f(x) = 2x^2 + \frac{7}{2}x + \frac{3}{4} = \frac{1}{4}(8x^2 + 14x + 3)$$

$$= \frac{1}{4}(8x^2 + 12x + 2x + 3)$$

$$= \frac{1}{4}[4x(2x + 3) + 1(2x + 3)]$$

$$= \frac{1}{4}[(2x + 3)(4x + 1)]$$



So, the value of $\frac{1}{4}[8x^2 + 14x + 3]$ is zero when $2x + 3 = 0$ or $4x + 1 = 0$.

i.e., when $x = -\frac{3}{2}$ or $x = -\frac{1}{4}$.

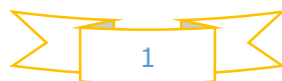
So, the zeroes of $2x^2 + \frac{7}{2}x + \frac{3}{4}$ are $-\frac{3}{2}$ and $-\frac{1}{4}$.

$$\therefore \text{Sum of zeroes} = -\frac{3}{2} - \frac{1}{4} = -\frac{7}{4} = -\frac{7}{2 \times 2}$$

$$= -\frac{(\text{coefficinet of } x)}{(\text{coefficinet of } x^2)}$$

$$\text{and product of zeroes} = \left(-\frac{3}{2}\right)\left(-\frac{1}{4}\right) = \frac{3}{8} = \frac{3}{2 \times 4}$$

$$= \frac{\text{Constant term}}{\text{coefficinet of } x^2}$$



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Hence, the relations between the zeroes and the coefficients of the polynomial is verified.

