

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 1:

$$4x^2 - 3x - 1.$$

Answer 1:

$$\text{Let } f(x) = 4x^2 - 3x - 1.$$

$$= 4x^2 - 4x + x - 1$$

$$= 4x(x - 1) + 1(x - 1)$$

$$= (x - 1)(4x + 1)$$

So, the value of $4x^2 - 3x - 1$ is zero when $x - 1 = 0$ or $4x + 1 = 0$ i.e., when $x = 1$ or $x = -\frac{1}{4}$.

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

$$\begin{aligned}\therefore \text{Sum of zeroes} &= 1 - \frac{1}{4} = \frac{3}{4} = -\frac{(-3)}{4} \\ &= -\left(\frac{\text{coefficinet of } x}{\text{coefficinet of } x^2}\right)\end{aligned}$$

$$\begin{aligned}\text{and product of zeroes} &= (1)\left(-\frac{1}{4}\right) = -\frac{1}{4} \\ &= \left(\frac{\text{Constant term}}{\text{coefficinet of } x^2}\right)\end{aligned}$$

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

