

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 10:

$$7y^2 - \frac{11}{3}y - \frac{2}{3}$$

Answer 10:

$$\begin{aligned}\text{Let } f(y) &= 7y^2 - \frac{11}{3}y - \frac{2}{3} \\ &= \frac{1}{3}[21y^2 - 3y - 2] \\ &= \frac{1}{3}[21y^2 - 14y + 3y - 2] \\ &= \frac{1}{3}[7y(3y - 2) + 1(3y - 2)] \\ &= \frac{1}{3}[(3y - 2)(7y + 1)]\end{aligned}$$



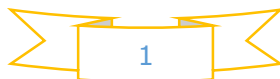
So, the value of $7y^2 - \frac{11}{3}y - \frac{2}{3}$ is zero when $3y - 2 = 0$ or $7y + 1 = 0$,

i.e., when, $y = \frac{2}{3}$ or $y = -\frac{1}{7}$.

So, the zeroes of $7y^2 - \frac{11}{3}y - \frac{2}{3}$ are $\frac{2}{3}$ and $-\frac{1}{7}$.

$$\begin{aligned}\therefore \text{Sum of zeroes} &= \frac{2}{3} - \frac{1}{7} = \frac{14-3}{21} = \frac{11}{21} = -\left(-\frac{11}{3 \times 7}\right) \\ &= -\left(\frac{\text{coefficinet of } y}{\text{coefficinet of } y^2}\right)\end{aligned}$$

$$\text{and product of zeroes} = \left(\frac{2}{3}\right)\left(-\frac{1}{7}\right) = -\frac{2}{21} = -\frac{2}{3 \times 7}$$



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$$= \left(\frac{\text{Constant term}}{\text{coefficinet of } y^2} \right)$$

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

