

# 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 9:

$$y^2 + \frac{3}{2}\sqrt{5}y - 5.$$

### Answer 9:

$$\text{Let } f(y) = y^2 + \frac{3}{2}\sqrt{5}y - 5$$

$$= \frac{1}{2}[2y^2 + 3\sqrt{5}y - 10]$$

$$= \frac{1}{2}[2y^2 + 4\sqrt{5}y - \sqrt{5}y - 10]$$

$$= \frac{1}{2}[2y(y + 2\sqrt{5}) - \sqrt{5}(y + 2\sqrt{5})]$$

$$= \frac{1}{2}[(y + 2\sqrt{5})(2y - \sqrt{5})]$$

So, the value of  $y^2 + \frac{3}{2}\sqrt{5}y - 5$  is zero when  $y + 2\sqrt{5} = 0$  or  $2y - \sqrt{5} = 0$ ,

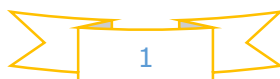
i.e., when  $y = -2\sqrt{5}$  or  $y = \frac{\sqrt{5}}{2}$ .

So, the zeroes of  $2y^2 + 3\sqrt{5}y - 10$  are  $-2\sqrt{5}$  and  $\frac{\sqrt{5}}{2}$ .

$$\therefore \text{Sum of zeroes} = -2\sqrt{5} + \frac{\sqrt{5}}{2} = -\frac{3\sqrt{5}}{2}$$

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

$$\text{and product of zeroes} = -2\sqrt{5} \times \frac{\sqrt{5}}{2} = -5$$



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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.

