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:

Let $f(y) = 7y^2 - \frac{11}{3}y - \frac{2}{3}$

$= \frac{1}{3}[21y^2 - 3y - 2]$

$= \frac{1}{3}[21y^2 - 14y + 3y - 2]$

$= \frac{1}{3}[7y(3y - 2) + 1(3y - 2)]$

$= \frac{1}{3}[(3y - 2)(7y + 1)]$

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 $-\frac{1}{7}$.

$\therefore$ Sum of zeroes $= \frac{2}{3} - \frac{1}{7} = \frac{14-3}{21} = \frac{11}{21} = -\left(-\frac{11}{3\times7}\right)$

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

and product of zeroes $= \left(\frac{2}{3}\right)\left(-\frac{1}{7}\right) = -\frac{2}{21} = -\frac{2}{3\times7}$

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

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