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 8:

$v^2 + 4\sqrt{3}v - 15.$

Answer 8:

Let $f(v) = v^2 + 4\sqrt{3}v - 15$

$= v^2 + (5\sqrt{3} - \sqrt{3})v - 15$

$= v^2 + 5\sqrt{3v} - \sqrt{3}v - 15$

$= v(v + 5\sqrt{3}) - \sqrt{3}(v + 5\sqrt{3})$

$= (v + 5\sqrt{3})(v - \sqrt{3})$

So, the value of $v^2 + 4\sqrt{3}v - 15$ is zero when $v + 5\sqrt{3} = 0$ or $v - \sqrt{3} = 0$.

i.e., when $v = -5\sqrt{3}$ or $v = \sqrt{3}$

So, the zeroes of $v^2 + 4\sqrt{3}v - 15$ are $-5\sqrt{3}$ and $\sqrt{3}$.

$\therefore$ Sum of zeroes $= -5\sqrt{3} + \sqrt{3} = -4\sqrt{3}$

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

and product of zeroes $= (-5\sqrt{3})(\sqrt{3}) = -5 \times 3 = -15$

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

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