Exercise 2A

Question 7:

We have

$$f(x) = x^2 - 5 = (x)^2 - \left(\sqrt{5}\right)^2$$

$$= \left(x - \sqrt{5}\right)\left(x + \sqrt{5}\right)$$

$$\left[\because a^2 - b^2 = (a-b)(a+b)\right]$$

$$f(x) = 0 \Rightarrow \left(x - \sqrt{5}\right)\left(x + \sqrt{5}\right) = 0$$

$$\therefore x - \sqrt{5} = 0 \text{ or } x + \sqrt{5} = 0$$

$$\Rightarrow x = \sqrt{5} \text{ or } x = -\sqrt{5}$$

So the zeros of f(x) are $\sqrt{5}$ and $-\sqrt{5}$

$$\text{Sum of zeros} = \sqrt{5} + \left(-\sqrt{5}\right) = 0 = -\frac{\text{Coeff. of } x}{\text{Coeff. of } x^2}$$

$$\text{Product of zeros} = \left(\sqrt{5}\right)\left(-\sqrt{5}\right) = -5 = \frac{-5}{1} = \frac{\text{Constant term}}{\text{Coeff. of } x^2}$$

Question 8:

Let

$$f(x) = 8x^2 - 4 = 4\left(2x^2 - 1\right) = 4\left[\left(\sqrt{2}x\right)^2 - 1^2\right]$$

$$\left[a^2 - b^2 = (a-b)(a+b)\right]$$

$$= 4\left(\sqrt{2}x - 1\right)\left(\sqrt{2}x + 1\right)$$

$$f(x) = 0 \Rightarrow \left(\sqrt{2}x - 1\right)\left(\sqrt{2}x + 1\right) = 0$$

$$\therefore \sqrt{2}x - 1 = 0 \text{ or } \sqrt{2}x + 1 = 0$$

$$\therefore x = \frac{1}{\sqrt{2}} \text{ or } x = -\frac{1}{\sqrt{2}}$$

So, the zeros of f(x) are $\frac{1}{\sqrt{2}}$ and $-\frac{1}{\sqrt{2}}$

$$\text{Sum of zeros} = \left(\frac{1}{\sqrt{2}}\right) + \left(-\frac{1}{\sqrt{2}}\right) = 0 = \frac{0}{8} = \frac{\text{Coeff. of } x}{\text{Coeff. of } x^2}$$

$$\text{Product of zeros} = \left(\frac{1}{\sqrt{2}}\right) \times \left(-\frac{1}{\sqrt{2}}\right) = -\frac{1}{2} = \frac{-4}{8}$$

$$= \frac{\text{constant term}}{\text{Coeff. of } x^2}$$

Question 9:

Let, $f(x) = 5u^2 + 10u = 5u(u+2)$

$f(x) = 0 \Rightarrow 5u(u+2) = 0$

$\therefore u = 0$ or $u + 2 = 0$

$\Rightarrow u = 0$ or $u = -2$

$$\text{Sum of zeros} = 0 + (-2) = -2 = -\frac{10}{5}$$

$$= -\frac{\text{Coeff. of } x}{\text{Coeff. of } x^2}$$

$$\text{Product of zero} = 0 \times (-2) = 0 = \frac{0}{5} = \frac{\text{Constant term}}{\text{Coeff. of } x^2}$$

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