Exercise 2A

Question 10:

If zeros are denoted by α and β then

$\alpha+\beta=2+(-6)=-4$ or $\alpha\beta=2\times(-6)=-12$

$\therefore$ Quadratic polynomial is

$x^2-(\alpha+\beta)x+\alpha\beta=x^2-(-4x)+(-12)=x^2+4x-12$

$$\text{Sum of zeros}=-\frac{\text{Coeff. of } x}{\text{Coeff. of } x^2}=\frac{-4}{1}=-4$$

Also, $\alpha+\beta=2+(-6)=-4$

$$\text{Product of zeros}=\frac{\text{Constant term}}{\text{Coeff. of } x^2}=\frac{-12}{1}=-12$$

Also, $\alpha\beta=2\times(-6)=-12$

Question 11:

Let α and β are the zeros then

$$\alpha+\beta=\frac{2}{3}+\left(-\frac{1}{4}\right)=\frac{8-3}{12}=\frac{5}{12}$$

$$\alpha\beta=\frac{2}{3}\times\left(-\frac{1}{4}\right)=-\frac{2}{12}=-\frac{1}{6}$$

$\therefore$ quadratic polynomial whose zeros are α,β is

$$x^2-(\alpha+\beta)x+\alpha\beta=x^2-\left(\frac{5}{12}\right)x+\left(-\frac{1}{6}\right)$$

$$=\frac{1}{12}\left(12x^2-5x-2\right)$$

$$\text{Sum of zeros}=-\frac{\text{Coeff. of } x}{\text{Coeff. of } x^2}=-\frac{-5}{12}=\frac{5}{12}$$

$$\text{Also sum of zeros}=\frac{2}{3}+\left(-\frac{1}{4}\right)=\frac{5}{12}$$

$$\text{Product of zeros}=\frac{\text{Constant term}}{\text{Coeff. of } x^2}=\frac{-2}{12}=\frac{-1}{6}$$

$$\text{Also Product of zeros}=\frac{2}{3}\times\left(-\frac{1}{4}\right)=\frac{-2}{12}=\frac{-1}{6}$$

Question 12:

Now, $\alpha+\beta=8$ and $\alpha\beta=12$

$$f(x)=x^2-(\alpha+\beta)x+\alpha\beta$$

$$=x^2-8x+12$$

$\therefore$ required polynomial is $x^2-8x+12$

Also $f(x)=x^2-8x+12=x^2-6x-2x=12$

$$=x(x-6)-2(x-6)$$

$$=(x-6)(x-2)$$

$$f(x)=0 \Rightarrow (x-6)(x-2)=0$$

$\therefore x-6=0$ or $x-2=0$

i.e. $x=6$ or $x=2$

$\therefore$ Zeros of polynomial are 6 and 2.

********** END **********