Exercise 2A

Question 15:

Let $\alpha, \beta$ be the zeros of required quadratic polynomial f(x)

We have,

$\alpha+\beta=0,\ \alpha\beta=-1$

$\therefore$ Polynomial whose zeros are $\alpha, \beta$ is

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

$$=x^2-0.x+(-1)=x^2-1$$

$\therefore$ Required polynomial is $x^2-1$

Now $f(x)=x^2-1=(x-1)(x+1)$

$f(x)=0 \quad \Rightarrow (x-1)(x+1)=0$

$\therefore$ Either $x-1=0$ or $x+1=0$

i.e Either $x=1$ or $x=-1$

$\therefore$ Zeros of the polynomial are 1 and -1

Question 16:

Let $\alpha, \beta$ be the zeros of required quadratic polynomial f(x)

We have,

$\alpha+\beta=\sqrt{2}$ and $\alpha\beta=-12$

$\therefore$ Polynomial whose zeros are $\alpha, \beta$ is

$$f(x)=x^2-(\alpha+\beta)x+\alpha\beta=x^2-\sqrt{2}x-12$$

$\therefore$ Polynomial required is $x^2-\sqrt{2}x-12$

For that, $f(x)=x^2-\sqrt{2}x-12$

$$=x^2-3\sqrt{2}x+2\sqrt{2}x-12$$

$$=x\left(x-3\sqrt{2}\right)x+2\sqrt{2}\left(x-3\sqrt{2}\right)$$

$$=\left(x-3\sqrt{2}\right)\left(x+2\sqrt{2}\right)$$

$f(x)=0 \quad \Rightarrow \left(x-3\sqrt{2}\right)\left(x+2\sqrt{2}\right)$

$\Rightarrow$ Either $x-3\sqrt{2}=0$ or $x+2\sqrt{2}=0$

$\therefore$ Either $x=3\sqrt{2}$ or $x=-2\sqrt{2}$

Question 17:

$\alpha$ and $\beta$ are the zeros of polynomial f(x) such that

$\alpha+\beta=6$ and $\alpha\beta=4$

The polynomial f(x) whose zeros are $\alpha, \beta$ is

$$x^2-(\alpha+\beta)x+\alpha\beta=x^2-6x+4$$

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