



Exercise 10A

Question 1:

(i) $x^2 - x + 3 = 0$ is a quadratic polynomial.

$\therefore x^2 - x + 3 = 0$ is a quadratic equation.

(ii) $2x^2 + \frac{5}{2}x - \sqrt{3} = 0$

$$\Rightarrow 4x^2 + 5x - 2\sqrt{3} = 0$$

Clearly $4x^2 + 5x - 2\sqrt{3} = 0$ is a quadratic polynomial.

$\therefore 2x^2 + \frac{5}{2}x - \sqrt{3} = 0$ is a quadratic equation.

(iii) $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$ is a quadratic polynomial.

$\therefore \sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$ is a quadratic equation.

(iv) $\frac{1}{3}x^2 + \frac{1}{5}x - 2 = 0$

$$\Rightarrow 5x^2 + 3x - 2 = 0$$

Clearly, $5x^2 + 3x - 2 = 0$ is a quadratic equation.

$\frac{1}{3}x^2 + \frac{1}{5}x - 2 = 0$ is a quadratic equation.

(v) $x^2 - 3x - \sqrt{x} + 4 = 0$ is not a quadratic polynomial since it contains \sqrt{x} , in which power $1/2$ of x is not an integer.

$\therefore x^2 - 3x - \sqrt{x} + 4 = 0$ is not a quadratic equation.

(vi) $x - \frac{6}{x} = 3$

$$\Rightarrow x^2 - 3x - 6 = 0$$

And $(x^2 - 3x - 6)$ being a polynomial of degree 2, it is a quadratic polynomial.

Hence, $x - \frac{6}{x} = 3$ is a quadratic equation.

(vii) $x + \frac{2}{x} = x^2$

$$\Rightarrow x^3 - x^2 - 2 = 0$$

And $(x^3 - x^2 - 2 = 0)$ being a polynomial of degree 3, it is not a quadratic polynomial.

Hence, $x + \frac{2}{x} = x^2$ is not a quadratic equation.

(viii) $x^2 - \frac{1}{x^2} = 5 \Rightarrow x^4 - 1 = 5x^2$

$$\Rightarrow x^4 - 5x^2 - 1 = 0$$

And $(x^4 - 5x^2 - 1 = 0)$ being a polynomial of degree 4.

Hence $x^2 - \frac{1}{x^2} = 5$ is not a quadratic equation.

Question 2:

The given equation is $3x^2 + 2x - 1 = 0$

(i) On substituting $x = -1$ in the equation, we get

$$\text{LHS} = 3x(-1)^2 + 2x(-1) - 1 = 3 - 2 - 1 = 0 = \text{RHS}$$

$\therefore x = -1$ is a solution of $3x^2 + 2x - 1 = 0$

(ii) On substituting $x = 1/3$ in the equation, we get

$$\text{LHS} = 3x\left(\frac{1}{3}\right)^2 + 2x\left(\frac{1}{3}\right) - 1 = 0 = \left(\frac{1}{3} + \frac{2}{3} - 1\right) = 0 = \text{RHS}$$

$\therefore x = \frac{1}{3}$ is a solution of $3x^2 + 2x - 1 = 0$

(iii) On substituting $x = -1/2$ in the equation, we get

$$\begin{aligned}\text{LHS} &= 3 \times \left(\frac{-1}{2}\right)^2 + 2 \times \left(\frac{-1}{2}\right) - 1 = 0 \\ &= \frac{3}{4} - 1 + 1 \neq 0\end{aligned}$$

$\therefore \text{RHS} \neq \text{LHS}$

$\therefore x = \frac{-1}{2}$ is not a solution of $3x^2 + 2x - 1 = 0$

Question 3:

Since $x = 1$ is a solution of $x^2 + kx + 3 = 0$ it must satisfy the equation.

$$\therefore (1)^2 + k(1) + 3 = 0 \Rightarrow k = -4$$

Hence the required value of $k = -4$

***** END *****