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 is $4x^2+5x-2\sqrt{3}=0$ 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.
$\frac{1}{3}x^2+\frac{1}{5}$ 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

$$LHS = 3\times(-1)^2+2\times(-1)-1 = 3-2-1 = 0 = RHS$$

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

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

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

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

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

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

$$= \frac{3}{4} - 1 + 1 \neq 0$$

$$\therefore RHS \neq LHS$$

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

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 **********