



Exercise 10A

Question 16:

$$48x^2 - 13x - 1 = 0 \Rightarrow 48x^2 - 16x + 3x - 1 = 0$$

$$\Rightarrow 16x(3x - 1) + 1(3x - 1) = 0$$

$$\Rightarrow 16x + 1 = 0 \quad \text{or} \quad (3x - 1) = 0$$

$$x = \frac{-1}{16} \quad \text{or} \quad x = \frac{1}{3}$$

Hence, $x = -1/16$, $x = 1/3$ are the roots of $48x^2 - 13x - 1 = 0$.

Question 17:

$$3x^2 + 11x + 10 = 0 \Rightarrow 3x^2 + 6x + 5x + 10 = 0$$

$$\Rightarrow 3x(x + 2) + 5(x + 2) = 0$$

$$\Rightarrow (3x + 5)(x + 2) = 0$$

$$\Rightarrow (3x + 5) = 0 \quad \text{or} \quad (x + 2) = 0$$

$$x = \frac{-5}{3} \quad \text{or} \quad x = -2$$

Hence, $x = -5/3$ and $x = -2$ are the roots of the equation $3x^2 + 11x + 10 = 0$.

Question 18:

$$4x^2 - 9x = 100 \Rightarrow 4x^2 - 9x - 100 = 0$$

$$\Rightarrow 4x^2 - 25x + 16x - 100 = 0$$

$$\Rightarrow x(4x - 25) + 4(4x - 25) = 0$$

$$\Rightarrow (4x - 25)(x + 4) = 0$$

$$(4x - 25) = 0 \quad \text{or} \quad (x + 4) = 0$$

$$x = \frac{25}{4} \quad \text{or} \quad x = -4$$

Hence, $x = 25/4$ and $x = -4$ are the roots of the equation $4x^2 - 9x = 100$.

Question 19:

$$\begin{aligned}
9x^2 - 22 + 8 &= 0 \Rightarrow 9x^2 - 18x - 4x + 8 = 0 \\
&\Rightarrow 9x(x - 2) - 4(x - 2) = 0 \\
&\Rightarrow (9x - 4)(x - 2) = 0 \\
&\Rightarrow (9x - 4) = 0 \text{ or } (x - 2) = 0 \\
&\quad x = \frac{4}{9} \text{ or } x = 2
\end{aligned}$$

Hence, $x=4/9$ and 2 are the roots of the equation $9x^2-22+8=0$

Question 20:

$$\begin{aligned}
15x^2 - 28 &= x \Rightarrow 15x^2 - x - 28 = 0 \\
&\Rightarrow 15x^2 - 21x + 20x - 28 = 0 \\
&\Rightarrow 3x(5x - 7) + 4(5x - 7) = 0 \\
&\Rightarrow (5x - 7)(3x + 4) = 0 \\
&\Rightarrow (5x - 7) = 0 \text{ or } (3x + 4) = 0 \\
&\quad x = \frac{7}{5} \text{ or } x = -\frac{4}{3}
\end{aligned}$$

Hence, $x=7/5$ and $x=-4/3$ are the roots of the given equation $15x^2-28=x$.

Question 21:

$$\begin{aligned}
4 - 11x &= 3x^2 \Rightarrow 3x^2 + 11x - 4 = 0 \\
&\Rightarrow 3x^2 + 12x - x - 4 = 0 \\
&\Rightarrow 3x(x + 4) - 1(x + 4) = 0 \\
&\Rightarrow (3x - 1)(x + 4) = 0 \\
&\Rightarrow 3x - 1 = 0 \text{ or } x + 4 = 0 \\
&\quad x = \frac{1}{3} \text{ or } x = -4
\end{aligned}$$

Hence, $x=1/3$ and -4 are the roots of given equation .

Question 22:

$$\begin{aligned}
x^2 - (1 + \sqrt{2})x + \sqrt{2} &= 0 \Rightarrow x^2 - 1.x - \sqrt{2}x + \sqrt{2} = 0 \\
&\Rightarrow x(x - 1) - \sqrt{2}(x - 1) = 0 \\
&\Rightarrow (x - 1)(x - \sqrt{2}) = 0 \\
&\quad (x - 1) = 0 \text{ or } x - \sqrt{2} = 0 \\
&\quad x = 1 \text{ or } x = \sqrt{2}
\end{aligned}$$

Hence, 1 and $\sqrt{2}$ are the roots of the given equation

Question 23:

$$\sqrt{3}x^2 + 11x + 6\sqrt{3} = 0$$

here, $6\sqrt{3} \times \sqrt{3} = 6 \times 3 = 18$ and $9 \times 2 = 18$ & $9 + 2 = 11$

$$\sqrt{3}x^2 + 11x + 6\sqrt{3} = 0 \Rightarrow \sqrt{3}x^2 + 9x + 2x + 6\sqrt{3} = 0$$

$$\Rightarrow \sqrt{3}(x + 3\sqrt{3}) + 2(x + 3\sqrt{3}) = 0$$

$$\Rightarrow (\sqrt{3}x + 2)(x + 3\sqrt{3}) = 0$$

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

$$x = \frac{-2}{\sqrt{3}} \text{ or } x = -3\sqrt{3}$$

$$x = \frac{-2 \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} \text{ or } x = -3\sqrt{3}$$

Hence, $\frac{-2\sqrt{3}}{3}$ and $-3\sqrt{3}$ are the roots of the given equation

Question 24:

$$4\sqrt{3}x^2 + 5x - 2\sqrt{3} = 0 \Rightarrow 4\sqrt{3}x^2 + 8x - 3x - 2\sqrt{3} = 0$$

$$\Rightarrow 4x(\sqrt{3}x + 2) - \sqrt{3}(\sqrt{3}x + 2) = 0$$

$$\Rightarrow (\sqrt{3}x + 2)(4x - \sqrt{3}) = 0$$

$$\Rightarrow (\sqrt{3}x + 2) = 0 \text{ or } (4x - \sqrt{3}) = 0$$

$$x = -\frac{2}{\sqrt{3}} = \frac{-2 \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} \text{ or } x = \frac{\sqrt{3}}{4}$$

$$x = \frac{-2\sqrt{3}}{3} \text{ or } x = \frac{\sqrt{3}}{4}$$

Hence, $\frac{-2\sqrt{3}}{3}$ and $\frac{\sqrt{3}}{4}$ are the roots of the given equation

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