



Exercise 10A

Question 9:

$$\begin{aligned}x^2 &= 18x - 77 \Rightarrow x^2 - 18x + 77 = 0 \\&\Rightarrow x^2 - 11x - 7x + 77 = 0 \\&\Rightarrow x(x - 11) - 7(x - 11) = 0 \\&\quad (x - 11)(x - 7) = 0 \\&\quad x - 11 = 0 \text{ or } x - 7 = 0 \\&\quad x = 11 \text{ or } x = 7\end{aligned}$$

Hence, 11 and 7 are the roots of equation $x^2=18x-77$

Question 10:

$$\begin{aligned}9x^2 + 6x + 1 &= 0 \Rightarrow (3x + 1)^2 = 0 \\&\Rightarrow 3x + 1 = 0 \Rightarrow x = \frac{-1}{3}\end{aligned}$$

Hence, $x=-1/3$ is the repeated root of the equation $9x^2+6x+1=0$

Question 11:

$$\begin{aligned}4x^2 - 12x + 9 &= 0 \Rightarrow (2x - 3)^2 = 0 \\&\Rightarrow 2x - 3 = 0 \\&\Rightarrow 2x = 3 \Rightarrow x = \frac{3}{2}\end{aligned}$$

Hence, $x=3/2$ is the repeated root of the equation

Question 12:

$$\begin{aligned}6x^2 + 11x + 3 &= 0 \Rightarrow 6x^2 + 9x + 2x + 3 = 0 \\&\Rightarrow 3x(2x + 3) + 1(2x + 3) = 0 \\&\Rightarrow (2x + 3)x(3x + 1) = 0 \\&\Rightarrow (2x + 3) = 0 \text{ or } (3x + 1) = 0 \\&\quad x = \frac{-3}{2} \text{ or } x = \frac{-1}{3}\end{aligned}$$

Hence, $x = -3/2$, $x = -1/3$ are the roots of $6x^2 + 11x + 3 = 0$

Question 13:

$$\begin{aligned} 6x^2 + x - 12 &\Rightarrow 6x^2 + 9x - 8x - 12 = 0 \\ &\Rightarrow 3x(2x + 3) - 4(2x + 3) = 0 \\ &\Rightarrow (3x - 4)(2x + 3) = 0 \\ &\Rightarrow 3x - 4 = 0 \text{ or } 2x + 3 = 0 \\ &\quad x = \frac{4}{3} \text{ or } x = -\frac{3}{2} \end{aligned}$$

Hence, $x = 4/3$, $x = -3/2$ are the roots of equation $6x^2 + x - 12 = 0$

Question 14:

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

Hence, $x = -1/3$ and 1 are the roots of the equation $3x^2 - 2x - 1 = 0$.

Question 15:

$$\begin{aligned} 6x^2 - x - 2 &= 0 \Rightarrow 6x^2 - 4x + 3x - 2 = 0 \\ &\Rightarrow 2x(3x - 2) + 1(3x - 2) = 0 \\ &\Rightarrow (3x - 2)(2x + 1) = 0 \\ &\Rightarrow (3x - 2) = 0 \text{ or } (2x + 1) = 0 \\ &\quad x = \frac{2}{3} \text{ or } x = -\frac{1}{2} \end{aligned}$$

Hence, $x = 2/3$, $x = -1/2$ are the roots of equation $6x^2 - x - 2 = 0$.

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