



Quadratic Equations Ex 14.1 Q1

$$x^2 + 1 = 0$$

$$\Rightarrow x^2 + i^2 = 0 \quad [\because i^2 = -1]$$

$$\Rightarrow (x + i)(x - i) = 0 \quad [a^2 - b^2 = (a + b)(a - b)]$$

$$\Rightarrow x = i, -i$$

Quadratic Equations Ex 14.1 Q2

$$9x^2 + 4 = 0$$

$$\Rightarrow (3x)^2 - (2i)^2 = 0 \quad [\because i^2 = -1]$$

$$\Rightarrow (3x + 2i)(3x - 2i) = 0$$

$$\Rightarrow 3x + 2i = 0 \quad \text{or} \quad 3x - 2i = 0$$

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

$$\therefore x = \frac{-2}{3}i, \frac{2}{3}i$$

Quadratic Equations Ex 14.1 Q3

$$x^2 + 2x + 5 = 0$$

Now, completing the squares, we get

$$(x + 1)^2 + 4 = 0$$

$$\Rightarrow (x + 1)^2 - 2i^2 = 0$$

$$\Rightarrow (x + 1 + 2i)(x + 1 - 2i) = 0$$

$$\Rightarrow (x + 1 + 2i) = 0 \quad \text{or} \quad (x + 1 - 2i) = 0$$

$$\therefore x = -1 - 2i, -1 + 2i$$

Quadratic Equations Ex 14.1 Q4

$$4x^2 - 12x + 25 = 0$$

Now, completing the squares, we get

$$\begin{aligned} & (2x - 3)^2 + 16 = 0 \\ \Rightarrow & (2x - 3)^2 - 4i^2 = 0 \\ \Rightarrow & (2x - 3 + 4i)(2x - 3 - 4i) = 0 \\ \Rightarrow & (2x - 3 + 4i) = 0 \quad \text{or} \quad (2x - 3 - 4i) = 0 \\ \therefore x = & \frac{3}{2} + 2i, \quad \frac{3}{2} - 2i \end{aligned}$$

***** END *****