



Quadratic Equations Ex 14.1 Q13

$$17x^2 - 8x + 1 = 0$$

We will apply discriminant rule,

$$x = \frac{-b \pm \sqrt{D}}{2a} \dots\dots\dots (A)$$

$$\begin{aligned} \text{where } D &= b^2 - 4ac \\ &= (-8)^2 - 4.17.1 \\ &= 64 - 68 \\ &= -4 \end{aligned}$$

from (A)

$$x = \frac{-(-8) \pm \sqrt{-4}}{2.17}$$

$$= \frac{8 \pm 2i}{34}$$

$$= \frac{4 \pm i}{17}$$

$$\therefore x = \frac{4}{17} + \frac{i}{17}, \quad \frac{4}{17} - \frac{i}{17}$$

Quadratic Equations Ex 14.1 Q14

$$27x^2 - 10x + 1 = 0$$

We will apply discriminant rule,

$$x = \frac{-b \pm \sqrt{D}}{2a} \dots\dots\dots (A)$$

where  $D = b^2 - 4ac$

$$\begin{aligned} &= (-10)^2 - 4.27.1 \\ &= 100 - 108 \\ &= -8 \end{aligned}$$

from (A)

$$x = \frac{-(-10) \pm \sqrt{-8}}{54}$$

$$= \frac{10 \pm 2\sqrt{2}i}{54}$$

$$= \frac{5 \pm \sqrt{2}i}{27}$$

$$\therefore x = \frac{5}{27} + \frac{\sqrt{2}i}{27}, \quad \frac{5}{27} - \frac{\sqrt{2}i}{27}$$

Quadratic Equations Ex 14.1 Q15

$$17x^2 + 28x + 12 = 0$$

We will apply discriminant rule,

$$x = \frac{-b \pm \sqrt{D}}{2a} \dots\dots\dots (A)$$

where  $D = b^2 - 4ac$

$$\begin{aligned} &= (28)^2 - 4.17.12 \\ &= 784 - 816 \\ &= -32 \end{aligned}$$

from (A)

$$x = \frac{-28 \pm \sqrt{-32}}{2.17}$$

$$= \frac{-28 \pm 4\sqrt{2}i}{34}$$

$$\therefore x = \frac{-14 \pm 2\sqrt{2}i}{17}$$

Quadratic Equations Ex 14.1 Q16

$$21x^2 - 28x + 10 = 0$$

We will apply discriminant rule,

$$x = \frac{-b \pm \sqrt{D}}{2a} \dots\dots\dots (A)$$

$$\begin{aligned} \text{where } D &= b^2 - 4ac \\ &= (-28)^2 - 4.21.10 \\ &= 784 - 840 \\ &= -56 \end{aligned}$$

from (A)

$$\begin{aligned} x &= \frac{-(-28) \pm \sqrt{-56}}{2.21} \\ &= \frac{28 \pm 2\sqrt{14}i}{42} \end{aligned}$$

$$\therefore x = \frac{2}{3} \pm \frac{\sqrt{14}}{21}i$$

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