



Complex Numbers Ex 13.3 Q1(i)

$$\text{Let } z = -5 + 12i$$

$$\begin{aligned}\Rightarrow |z| &= \sqrt{(-5)^2 + 12^2} \\ &= \sqrt{25 + 144} \\ &= \sqrt{169} \\ &= 13\end{aligned}$$

$$\begin{aligned}\therefore \sqrt{-5 + 12i} &= \pm \left\{ \sqrt{\frac{13 + (-5)}{2}} + i \sqrt{\frac{13 - (-5)}{2}} \right\} \quad (\because y > 0) \\ &= \pm \left\{ \sqrt{\frac{8}{2}} + i \sqrt{\frac{18}{2}} \right\} \\ &= \pm \{2 + 3i\}\end{aligned}$$

Complex Numbers Ex 13.3 Q1(ii)

$$\text{let } z = -7 - 24i$$

$$\begin{aligned}\text{then } |z| &= \sqrt{(-7)^2 + (-24)^2} \\ &= \sqrt{49 + 576} \\ &= \sqrt{625} \\ &= 25\end{aligned}$$

$$\begin{aligned}\therefore \sqrt{-7 - 24i} &= \pm \left\{ \sqrt{\frac{25 - 7}{2}} - i \sqrt{\frac{25 + 7}{2}} \right\} \quad (\because y < 0) \\ &= \pm \left\{ \sqrt{\frac{18}{2}} - i \sqrt{\frac{32}{2}} \right\} \\ &= \pm \{ \sqrt{9} - i \sqrt{16} \} \\ &= \pm \{3 - 4i\}\end{aligned}$$

Complex Numbers Ex 13.3 Q1(iii)

$$\text{let } z = 1 - i$$

$$\begin{aligned}\text{then } |z| &= \sqrt{1^2 + (-1)^2} \\ &= \sqrt{1 + 1} \\ &= \sqrt{2}\end{aligned}$$

$$\begin{aligned}\therefore \sqrt{1 - i} &= \pm \left(\sqrt{\frac{\sqrt{2} + 1}{2}} - i \sqrt{\frac{\sqrt{2} - 1}{2}} \right) \quad (\because y < 0) \\ &= \pm \left(\sqrt{\frac{\sqrt{2} + 1}{2}} - i \sqrt{\frac{\sqrt{2} - 1}{2}} \right)\end{aligned}$$

***** END *****

