

Chapter **5**
COMPLEX NUMBERS

If amplitude of $(z - 1)$ is $\frac{\pi}{2}$, then find the locus of z .

Sol.

Given, $\text{amp}(z - 1) = \frac{\pi}{2}$, where $z = x + iy$.

$$z - 1 = x + iy - 1$$

$$z - 1 = (x - 1) + iy$$

Now, $\text{amp}(z - 1) = \text{amp}((x - 1) + iy) = \frac{\pi}{2}$

$$\Rightarrow \tan^{-1}\left(\frac{y}{x-1}\right) = \frac{\pi}{2}$$

$$\left(\frac{y}{x-1}\right) = \tan \frac{\pi}{2} = \infty$$

$$\left(\frac{y}{x-1}\right) = \infty$$

$$\frac{x-1}{y} = 0, y \neq 0$$

$$x - 1 = 0$$

$\therefore$ The locus of 'z' is $x - 1 = 0$, where $y \neq 0$.