EX: Find the value (in polar form) of \((6 + j5)^{1/5}\).

ANS: \(1.51e^{j7.96^\circ}\) (approx)

SOL’N: First, we convert the number being raised to a power to polar form:

\[
6 + j5 = \sqrt{6^2 + 5^2} e^{j \tan^{-1}(\frac{5}{6})} \approx 7.81e^{j39.8^\circ}
\]

Now take the power inside the parentheses and use the identity

\[
(ab)^n = a^n b^n
\]

giving the answer:

\[
(6 + j5)^{1/5} = 7.81^{1/5} e^{j39.8^\circ/5} \approx 1.51e^{j7.96^\circ}
\]