3. Show that \( z = 3 + 3i \) is a root of the equation \( z^3 - 18z + 108 = 0 \) and obtain the remaining roots of the equation.

\[
(3 + 3i)^3 = 27 + 81i + 81i^2 + 27i^3 = -54 + 54i. 
\]

Thus
\[
(3 + 3i)^3 - 18(3 + 3i) + 108 = 
-54 + 54i - 54 - 54i + 108 = 0
\]

Since \( 3 + 3i \) is a root, \( 3 - 3i \) is a root.
These give a factor \((z - (3 + 3i))(z - (3 - 3i)) = (z - 3)^2 + 9 = z^2 - 6z + 18.\)

\[
z^3 - 18z + 108 = (z^2 - 6z + 18)(z + 6)
\]

The remaining roots are \( 3 - 3i \) and \(-6\).