LCH - 2013 - Paper 1

Section A — Concepts and Skills — 150 marks

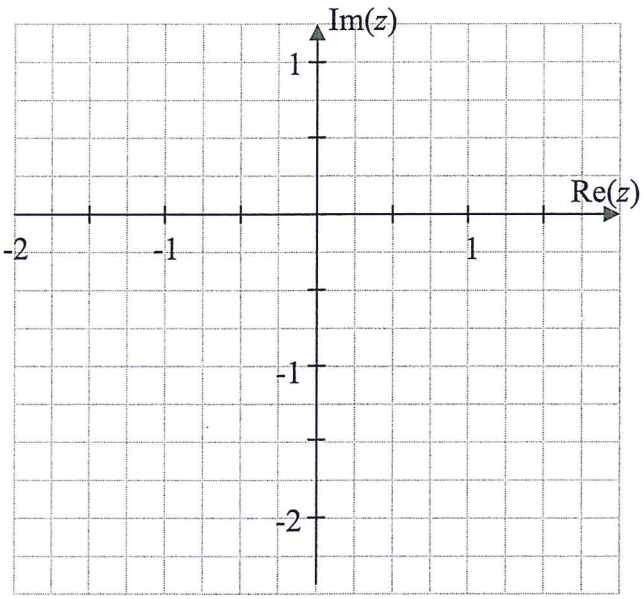
Answer **all six** questions from this section.

Question 1 **(25 marks)**

$z = \dfrac{4}{1+\sqrt{3}i}$ is a complex number, where $i^2 = -1$.

(a) Verify that z can be written as $1-\sqrt{3}i$.

(b) Plot z on an Argand diagram and write z in polar form.



(c) Use De Moivre's theorem to show that $z^{10} = -2^9\left(1-\sqrt{3}i\right)$.