Question 2 (25 marks)
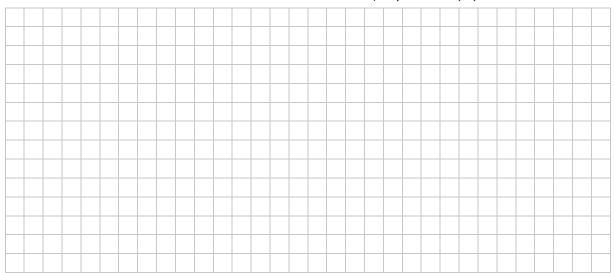
$z = -\sqrt{3} + i$, where $i^2 = -1$.

(a) Use De Moivre's Theorem to write z^4 in the form $a + b\sqrt{c}\,i$, where a, b, and $c \in \mathbb{Z}$.

(b) The complex number w is such that $|w| = 3$ and w makes an angle of $30°$ with the positive sense of the real axis. If $t = zw$, write t in its simplest form.