## Question 3 (7 marks)

Let $z_{1}=(1-i)^{m}$ and $z_{2}=(1+i \sqrt{3})^{n}$, where $m$ and $n$ are positive integers.
(a) Find $z_{1}$ and $z_{2}$ in $r \operatorname{cis} \theta$ form.

(b) (i) If $z_{1}=z_{2}$, show that $m=2 n$.

(ii) Hence find the smallest positive integers $m$ and $n$ such that $z_{1}=z_{2}$.


