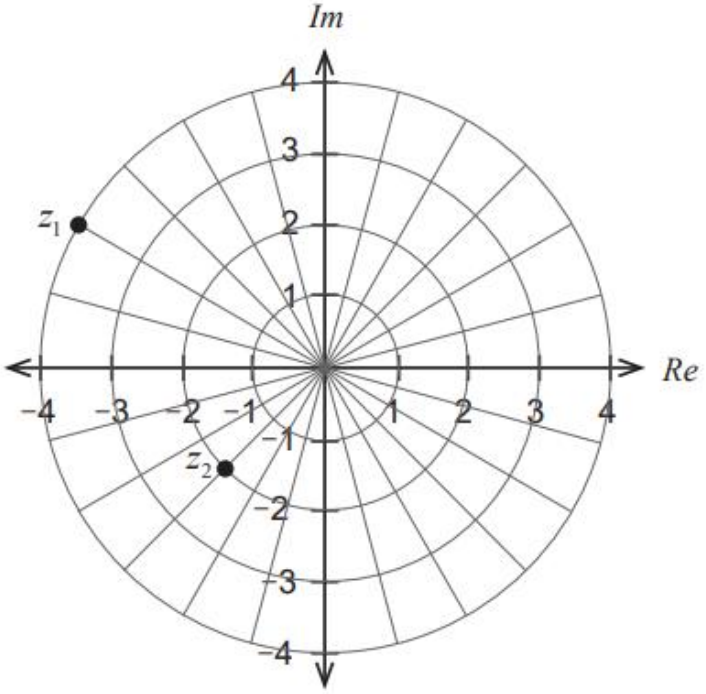
**Question 6** **(8 marks)**

Two complex numbers $z_1 = 4cis\left(\frac{5\pi}{6}\right)$ and $z_2$ are shown in the Argand plane below.




(a) Determine the exact polar form for $z_2$. (2 marks)

(b) Plot the complex number $w = z_1 \times (z_2)^{-1}$ on the Argand diagram above. (3 marks)

(c) If $z_1 = 4cis\left(\frac{5\pi}{6}\right)$ is a solution of the equation $z^n = r$ where $r$ is a positive real number and $n$ is a positive integer, determine the smallest possible value for $r$ in the form $2^p$.

Justify your answer. (3 marks)