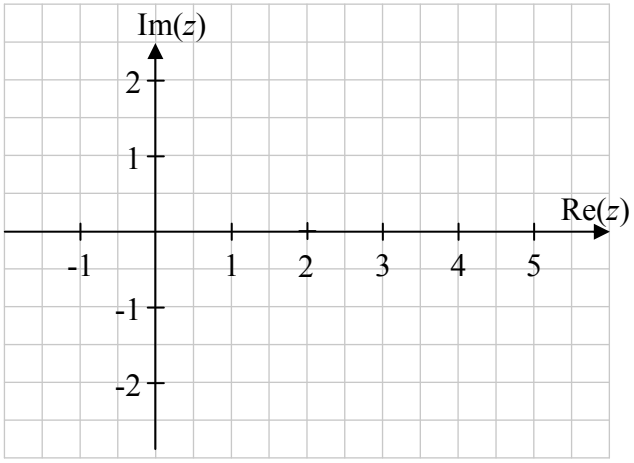
Question 2 **(25 marks)**

Let $z_1 = 1 - 2i$, where $i^2 = -1$.

(a) The complex number z_1 is a root of the equation $2z^3 - 7z^2 + 16z - 15 = 0$.
Find the other two roots of the equation.

(b) **(i)** Let $w = z_1\overline{z}_1$, where $\overline{z}_1$ is the conjugate of z_1. Plot z_1, $\overline{z}_1$ and w on the Argand diagram and label each point.



(ii) Find the measure of the acute angle, $\overline{z}_1 w z_1$, formed by joining $\overline{z}_1$ to w to z_1 on the diagram above. Give your answer correct to the nearest degree.