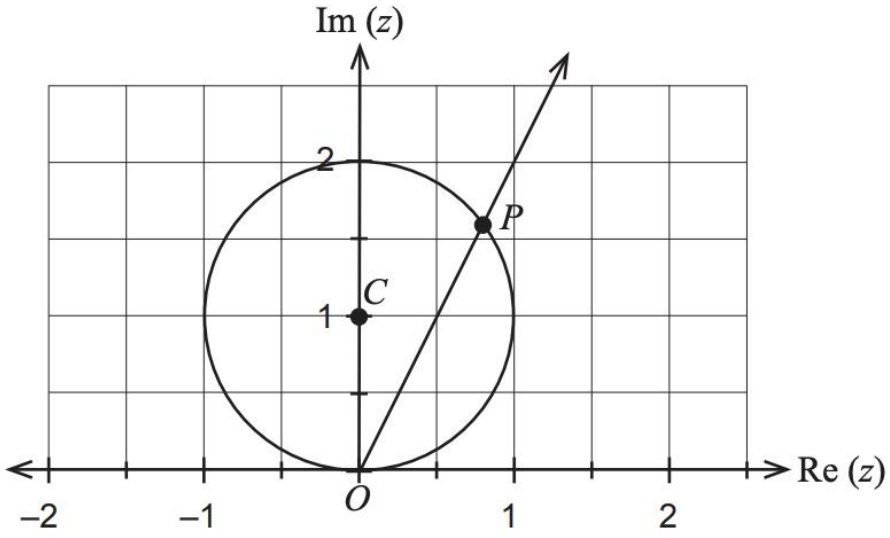
Question 6 **(6 marks)**

A circle and a ray are indicated in the complex plane. The ray has equation $\arg(z) = \tan^{-1}(2)$.
Point C is the centre of the circle. Point P is the intersection of the circle and the ray.



(a) Determine the equation for the circle. (2 marks)

Point P determines a complex number $w = r\,cis\theta$.

(b) Determine the exact values for r, θ. (4 marks)