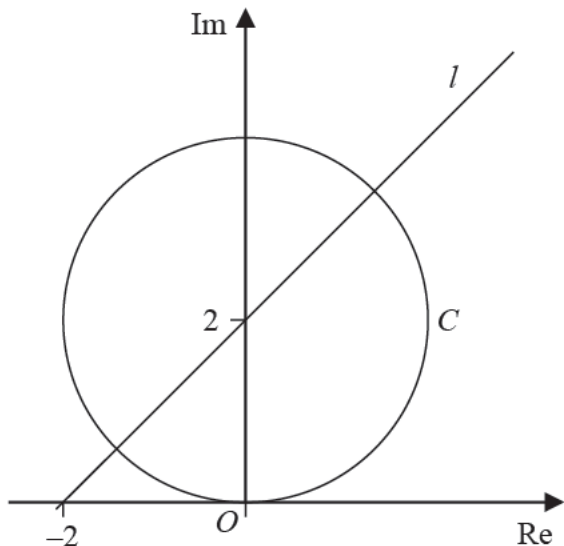**3.**

Figure 1

The Argand diagram, shown in Figure 1, shows a circle C and a half-line l.

(a) Write down the equation of the locus of points represented in the complex plane by

   (i) the circle C,

   (ii) the half-line l.

(2)

(b) Use set notation to describe the set of points that lie on both C and l.

(1)

(c) Find the complex numbers that lie on both C and l, giving your answers in the form $a + ib$, where $a, b \in \mathbb{R}$.

(3)