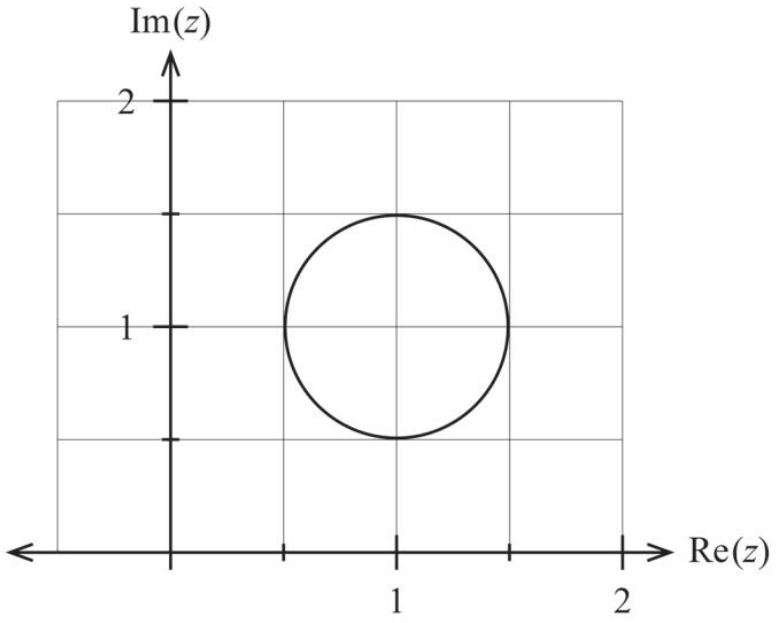
Question 10 **(8 marks)**

(a) A circle is drawn in the Argand plane. Let z be any point on this circle.

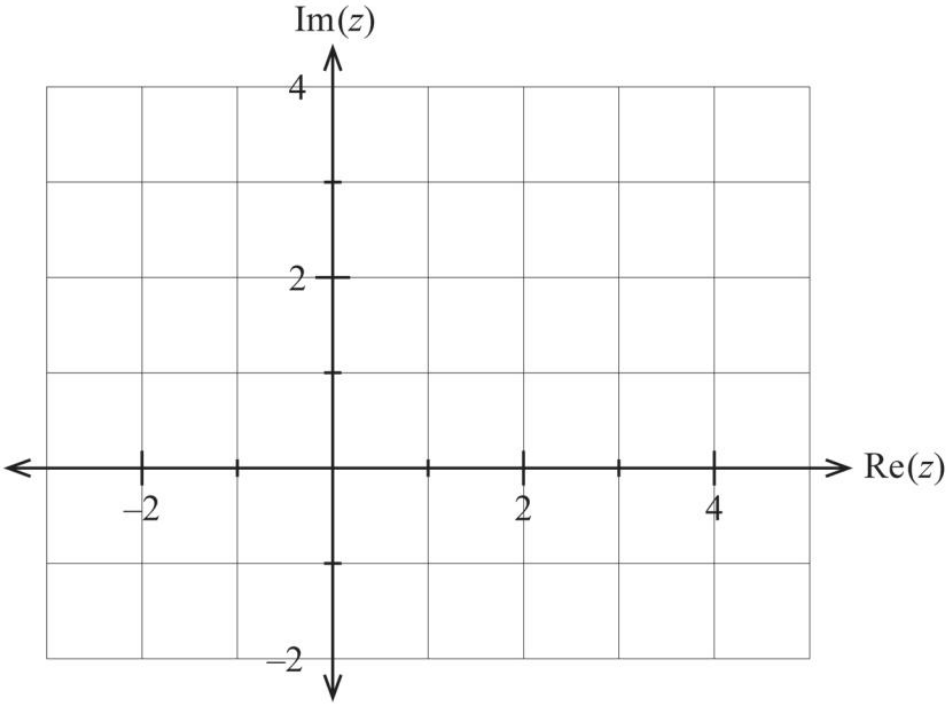


(i) State the equation for this circle. (2 marks)

(ii) Given that $a \leq |z - i| \leq b$, determine the exact values for a and b. (2 marks)

(b) Sketch, on the Argand diagram below, the locus given by the intersection of:

$z - \bar{z} \leq 6i$ and $\frac{\pi}{4} \leq Arg\,(z - 1 + i) \leq \frac{3\pi}{4}$. (4 marks)



A spare diagram is provided at the end of this Question/Answer booklet. If you need to use it, cross out this attempt and indicate that you have redrawn it on the spare diagram.