

5. Given that on an Argand diagram the locus of points defined by  $|z + 5 - 12i| = 10$  is a circle,

(a) write down,

(i) the coordinates of the centre of this circle,

(ii) the radius of this circle.

(2)

(b) Show, by shading on an Argand diagram, the set of points defined by

$$|z + 5 - 12i| \leq 10$$

(1)

(c) For the set of points defined in part (b), determine the maximum value of  $|z|$

(3)

The set of points  $A$  is defined by

$$A = \{z : 0 \leq \arg(z + 5 - 20i) \leq \pi\} \cap \{z : |z + 5 - 12i| \leq 10\}$$

(d) Determine the area of the region defined by  $A$ , giving your answer to 3 significant figures.

(4)