3. (a) Show on an Argand diagram the locus of points given by

$$|z - 10 - 12i| = 8$$

(2)

Set A is defined by

$$A = \left\{ z : 0 \leqslant \arg(z - 10 - 10i) \leqslant \frac{\pi}{2} \right\} \cap \left\{ z : |z - 10 - 12i| \leqslant 8 \right\}$$

(b) Shade the region defined by A on your Argand diagram.

(2)

(c) Determine the area of the region defined by A.

(5)