3. The transformation T from the z-plane to the w-plane is given by

$$w = \frac{z}{z + 4\mathrm{i}} \qquad z \neq -4\mathrm{i}$$

The circle with equation $|z| = 3$ is mapped by T onto the circle C

Determine

(i) a Cartesian equation of C

(ii) the centre and radius of C

(8)

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Question 3 continued

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Question 3 continued

(Total for Question 3 is 8 marks)