6. A complex number z is represented by the point P in an Argand diagram.

Given that

$$|z - 2i| = |z - 3|$$

(a) sketch the locus of P. You do **not** need to find the coordinates of any intercepts.

(2)

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

$$w = \frac{iz}{z - 2i} \qquad z \neq 2i$$

Given that T maps $|z - 2i| = |z - 3|$ to a circle C in the w-plane,

(b) find the equation of C, giving your answer in the form

$$|w - (p + qi)| = r$$

where p, q and r are real numbers to be determined.

(6)

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(Total for Question 6 is 8 marks)