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5. $$f(x) = (9x^2 + d)\left(x^2 - 8x + (10d + 1)\right)$$

where d is a positive constant.

(a) Find the four roots of $f(x)$ giving your answers in terms of d.

(3)

Given $d = 4$

(b) Express these four roots in the form $a + ib$, where $a, b \in \mathbb{R}$.

(2)

(c) Show these four roots on a single Argand diagram.

(2)

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Question 5 continued

Q5

(Total 7 marks)