A Level · Edexcel · Further Maths

18 mins 2 questions

1.1 Complex Numbers & Argand Diagrams

1.1.1 Introduction to Complex Numbers / 1.1.2 Solving Equations with Complex Roots / 1.1.3 Modulus & Argument / 1.1.4 Modulus-Argument Form / 1.1.5 Loci in Argand Diagrams / 1.1.6 Regions in Argand Diagrams

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Total Marks **/18**

1 (a) In an Argand diagram, the points A and B are represented by the complex numbers $-3+2i$ and $5-4i$ respectively. The points A and B are the end points of a diameter of a circle C.

(a) Find the equation of C, giving your answer in the form

$$|z-a|=b \qquad a \in \mathbb{C},\ b \in \mathbb{R}$$

(3 marks)

(b) The circle D, with equation $|z-2-3i|=2$, intersects C at the points representing the complex numbers z_1 and z_2

(b) Find the complex numbers z_1 and z_2

(6 marks)

2 (a) $$f(z) = z^4 + az^3 + bz^2 + cz + d$$

where a, b, c and d are real constants.

Given that $-1 + 2i$ and $3 - i$ are two roots of the equation $f(z) = 0$

(a) Show all the roots of $f(z) = 0$ on a single Argand diagram.

(4 marks)

(b) (b) Find the values of a, b, c and d.

(5 marks)