

A Level Math

9709/32

Paper 3

May June 2022

Full Solution

Cambridge International AS & A Level

CANDIDATE NAME

CANDIDATE NUMBER

CANDIDATE NUMBER

MATHEMATICS

Paper 3 Pure Mathematics 3

9709/32

May/June 2022

1 hour 45 minutes

You must answer on the question paper.

You will need: List of formulae (Ref 10)

INSTRUCTIONS

- Answer all questions.
- Use a pencil for your final answer. You may use an felt marker for any diagrams or graphs.
- Show your working. Number questions and sub-questions in the margin at the end of the page.
- Show your answer to each question in the space provided.
- Do not use an erasable pen or correction fluid.
- Do not write on any bar codes.
- If additional space is needed, you should use the back page of the end of the booklet. The question number or sub-question must be clearly shown.
- You should use a calculator which accepts algebraic expressions.
- You must show all necessary working clearly. No marks will be given for unexplained answers from a calculator.

10. Verify by calculation that the root lies between 1 and 2.

$$f(x) = \ln x - 3x + x^2$$

$$f(1) = \ln 1 - 3(1) + 1^2$$

$$= \ln 1 - 6 + 4 = -1.30 < 0$$

$$f(2) = \ln 2.8 - 3(2.8) + (2.8)^2 = 0.469 > 0$$

$$f(1) < 0 \text{ and } f(2) > 0$$



11. Determine the $\arg z$ for the complex number z given, and express in radians. (10)

$$(1 + j\sqrt{3})^2 =$$

$$= 1^2 + 2j\sqrt{3} + (j\sqrt{3})^2$$

$$= 1 + 2j\sqrt{3} - 3$$

$$= -2 + 2j\sqrt{3}$$

$$= 2(-1 + j\sqrt{3})$$

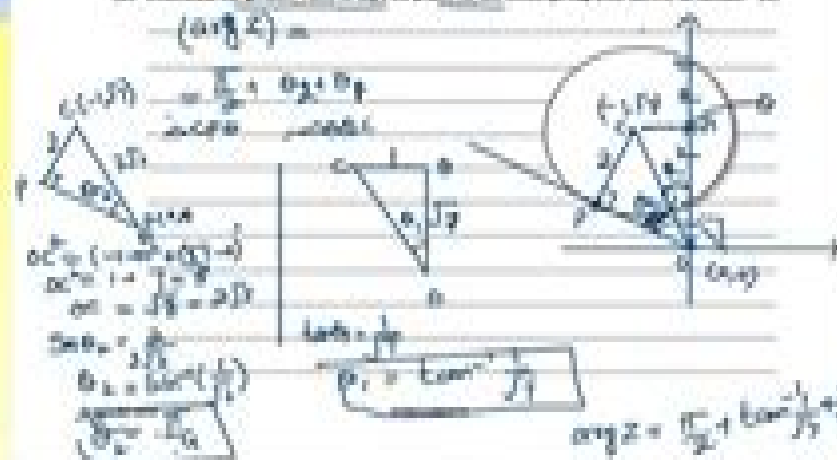
$$= 2 \times 2 \times \left(\cos \frac{2\pi}{3} + j \sin \frac{2\pi}{3} \right)$$

$$= 4 \left(\cos \frac{2\pi}{3} + j \sin \frac{2\pi}{3} \right)$$

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Table of Contents June 14 9709 32 Max Papers Math

1. Understanding the eBook June 14 9709 32 Max Papers Math
 - The Rise of Digital Reading June 14 9709 32 Max Papers Math
 - Advantages of eBooks Over Traditional Books
2. Identifying June 14 9709 32 Max Papers Math
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an June 14 9709 32 Max Papers Math
 - User-Friendly Interface
4. Exploring eBook Recommendations from June 14 9709 32 Max Papers Math
 - Personalized Recommendations
 - June 14 9709 32 Max Papers Math User Reviews and Ratings
 - June 14 9709 32 Max Papers Math and Bestseller Lists
5. Accessing June 14 9709 32 Max Papers Math Free and Paid eBooks
 - June 14 9709 32 Max Papers Math Public Domain eBooks
 - June 14 9709 32 Max Papers Math eBook Subscription Services
 - June 14 9709 32 Max Papers Math Budget-Friendly Options

6. Navigating June 14 9709 32 Max Papers Math eBook Formats
 - ePub, PDF, MOBI, and More
 - June 14 9709 32 Max Papers Math Compatibility with Devices
 - June 14 9709 32 Max Papers Math Enhanced eBook Features
7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of June 14 9709 32 Max Papers Math
 - Highlighting and Note-Taking June 14 9709 32 Max Papers Math
 - Interactive Elements June 14 9709 32 Max Papers Math
8. Staying Engaged with June 14 9709 32 Max Papers Math
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers June 14 9709 32 Max Papers Math
9. Balancing eBooks and Physical Books June 14 9709 32 Max Papers Math
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection June 14 9709 32 Max Papers Math
10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
11. Cultivating a Reading Routine June 14 9709 32 Max Papers Math
 - Setting Reading Goals June 14 9709 32 Max Papers Math
 - Carving Out Dedicated Reading Time
12. Sourcing Reliable Information of June 14 9709 32 Max Papers Math
 - Fact-Checking eBook Content of June 14 9709 32 Max Papers Math
 - Distinguishing Credible Sources
13. Promoting Lifelong Learning
 - Utilizing eBooks for Skill Development
 - Exploring Educational eBooks
14. Embracing eBook Trends
 - Integration of Multimedia Elements

- Interactive and Gamified eBooks

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