

QQQ – Core Pure 1 – Chapter 1 – Complex Numbers (Version 1)

Total Marks: 24

(24 = Platinum, 22 = Gold, 19 = Silver, 16 = Bronze)

1. Calculate the product

$$(3 + i)(2 - i)$$

Circle your answer.

[1 mark]

- $5 - i$
- $5 + i$
- $7 - i$
- $7 + i$

(Total 1 marks)

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2. In this question you must show detailed reasoning.

(a) Express $\frac{8 + i}{2 - i}$ in the form $a + bi$ where a and b are real. **[2]**

(b) Solve the equation $4x^2 - 8x + 5 = 0$. Give your answer(s) in the form $c + di$ where c and d are real. **[2]**

(Total 4 marks)

OCR A AS June 2024 Paper 1 Q2

3. The complex number z satisfies the equation $z + 2iz^* + 1 - 4i = 0$.

You are given that $z = x + iy$, where x and y are real numbers.

Determine the values of x and y . **[4]**

(Total 4 marks)

OCR MEI A2 June 2025 Paper 1 Q1

4. Given that $2 - 4i$ is a root of the equation

$$z^2 + pz + q = 0,$$

where p and q are real constants,

(a) write down the other root of the equation, (1)

(b) find the value of p and the value of q . (3)

(Total 4 marks)

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5. $2 - 3i$ is one root of the equation

$$z^3 + mz + 52 = 0$$

where m is real.

(a) Find the other roots. [3 marks]

(b) Determine the value of m . [2 marks]

(Total 5 marks)

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6. It is given that $1 - 3i$ is one root of the quartic equation

$$z^4 - 2z^3 + pz^2 + rz + 80 = 0$$

where p and r are real numbers.

(a) Express $z^4 - 2z^3 + pz^2 + rz + 80$ as the product of two quadratic factors with real coefficients. [4 marks]

(b) Find the value of p and the value of r . [2 marks]

(Total 6 marks)

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