1.1 Complex Numbers: 10-minute Pack

EDEXCEL 9FM0 · Calculator allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 The complex number z is $z = 1 + i$.

(a) Write z in modulus-argument form $r(\cos\theta + i\sin\theta)$, with θ in degrees. **(3)**

(b) Use de Moivre's theorem to find z^3, giving your answer in the form $a + bi$, with a and b exact. **(4)**

(Total for Question 1 is 7 marks)

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Mark scheme · 1.1 Complex Numbers: 10-minute Pack

Question 1

(a) finds the modulus **M1**

(a) $r = \sqrt{2}$ **A1**

(a) $\theta = 45$ degrees **A1**

(a) Answer: $z = \sqrt{2}(\cos 45 + i \sin 45)$ degrees

(b) $z^3 = (\sqrt{2})^3 (\cos(3 \times 45) + i \sin(3 \times 45))$ **M1**

(b) modulus $2\sqrt{2}$ and argument 135 degrees **A1**

(b) uses exact values of cos(135) and sin(135) **M1**

(b) -2 + 2i **A1**

(b) Answer: -2 + 2i

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