AQA

Further Pure Mathematics 2

分类真题

2019-2022 册

A Level Clouds 出品

目录

Chapter 1

Roots and Polynomials

3 The roots of the cubic equation

$$3z^3 + 9z + r = 0$$

where r is real, are α, β and γ.

3 (a) (i) Write down the value of $\alpha\beta + \beta\gamma + \gamma\alpha$.

[1 mark]

$\alpha\beta + \beta\gamma + \gamma\alpha =$ _____

3 (a) (ii) Hence show that $\alpha^2 + \beta^2 + \gamma^2 = -6$

[3 marks]

3 (a) (iii) Hence explain why the cubic equation must have two non-real roots and one real root.

[2 marks]

3 (b) (i) Given that $\alpha = 1 + \sqrt{6}\,\mathrm{i}$, find the value of $\alpha\beta\gamma$.

[3 marks]

$\alpha\beta\gamma =$ _____

3 (b) (ii) Hence write down the value of r.

[1 mark]

$r =$ _____

9 The equation

$$mx^4 + x^3 + (m+n)\,x^2 - x + n = 0\,, \qquad \text{where} \quad m \neq 0 \quad \text{and} \quad n \neq 0$$

has roots α, β, γ and δ

It is given that $\alpha + \beta = 0$

9 (a) (i) Explain why $\gamma + \delta = -\dfrac{1}{m}$

[1 mark]

9 (a) (ii) Show that $n = -m$

[6 marks]

9 (b) **Hence** find all possible values of m for which the roots α, β, γ and δ are real and distinct.

[4 marks]

Answer _____