



Y1 Complex Numbers – Complex Roots of Polynomials Exam Questions (Edexcel)

Q1.

Given that 4 and $2i - 3$ are roots of the equation

$$x^3 + ax^2 + bx - 52 = 0$$

where a and b are real constants,

(a) write down the third root of the equation,

(1)

(b) find the value of a and the value of b .

(5)

(Total for question = 6 marks)

(Q06 6667/01, June 2017)

Q2.

$$f(x) = 9x^3 - 33x^2 - 55x - 25$$

Given that $x = 5$ is a solution of the equation $f(x) = 0$, use an algebraic method to solve $f(x) = 0$ completely.

(5)

(Total for question = 5 marks)

(Q02 6667/01, June 2015)

Q3.

Given that 4 and $2i - 3$ are roots of the equation

$$x^3 + ax^2 + bx - 52 = 0$$

where a and b are real constants,

(a) write down the third root of the equation,

(1)

(b) find the value of a and the value of b .

(5)

(Total for question = 6 marks)

(Q06 6667/01, June 2017)



Q4.

$$f(x) = (4x^2 + 9)(x^2 - 2x + 5)$$

(a) Find the four roots of $f(x) = 0$

(4)

(b) Show the four roots of $f(x) = 0$ on a single Argand diagram.

(2)

(Total 6 marks)

(Q04 6667/01/R, June 2013)

Q5.

Given that $x = \frac{1}{2}$ is a root of the equation

$$2x^3 - 9x^2 + kx - 13 = 0, \quad k \in \mathbb{R}$$

find

(a) the value of k ,

(3)

(a) the other 2 roots of the equation.

(4)

(Total 7 marks)

(Q03 6667/01, June 2013)

Q6.

$$f(x) = (4x^2 + 9)(x^2 - 6x + 34)$$

(a) Find the four roots of $f(x) = 0$

Give your answers in the form $x = p + iq$, where p and q are real.

(5)

(b) Show these four roots on a single Argand diagram.

(2)

(Total 7 marks)

(Q06 6667/01, Jan 2013)



Q7.

$$f(x) = 2x^3 - 6x^2 - 7x - 4$$

(a) Show that $f(4) = 0$

(1)

(b) Use algebra to solve $f(x) = 0$ completely.

(4)

(Total 5 marks)

(Q02 6667/01, June 2012)

Q8.

$$z = \frac{4}{1+i}$$

Find, in the form $a + ib$ where $a, b \in \mathbb{R}$

(a) z

(2)

(b) z^2

(2)

Given that z is a complex root of the quadratic equation $x^2 + px + q = 0$, where p and q are real integers,

(c) find the value of p and the value of q .

(3)

(Total for question = 7 marks)

(Q04 6667/01, June 2016)

Q9.

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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(Q04 6667/01, Jan 2014)

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