

AQA – Complex numbers – A2 Further Mathematics P1**1. June/2021/Paper_7367/1/No.2**

Given that $z = 1 - 3i$ is one root of the equation $z^2 + pz + r = 0$, where p and r are real, find the value of r .

Circle your answer.

[1 mark]

–8

–2

6

10

2. June/2021/Paper_7367/1/No.6

(a) Show that the equation

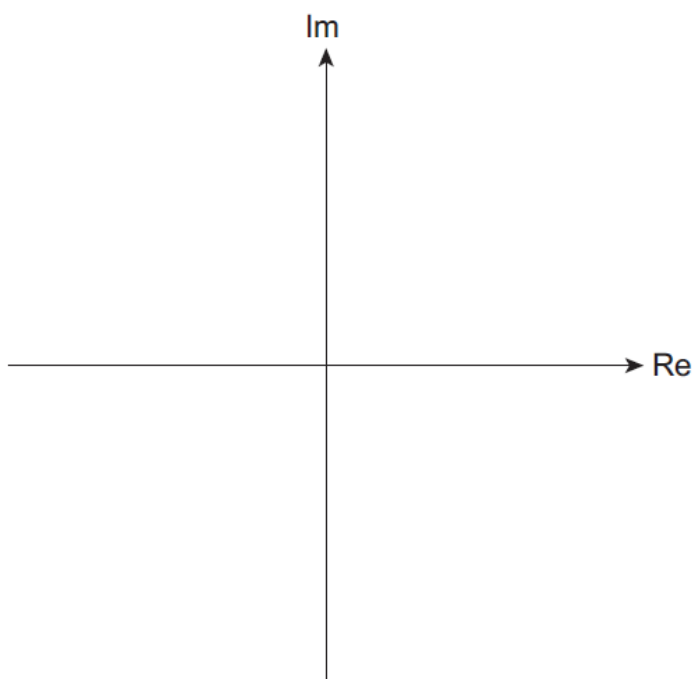
$$(2z - z^*)^* = z^2$$

has exactly **four** solutions and state these solutions.

[7 marks]

(b) (i) Plot the four solutions to the equation in part (a) on the Argand diagram below and join them together to form a quadrilateral with one line of symmetry.

[2 marks]



(b) (ii) Show that the area of this quadrilateral is $\frac{\sqrt{15}}{2}$ square units.

[1 mark]