Cambridge High School

Level 3 Calculus, 2018

91577 Apply the algebra of complex numbers in solving problems

**QUESTION ONE**

1. If and, find, giving your solution in the form .
2. Write in the form, where and are integers.
3. Solve the following equation simultaneously for in terms of
4. Find the range or ranges, of values can take for to have two real distinct roots.
5. Given that and have a common factor where and are non-zero, show that .

**QUESTION TWO**

1. Simplify as far as possible, the expression
2. Find if the remainder is 13 when is divided by

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1. If is a root of the quadratic equation show that and .
2. Solve the equation where is a real and positive. (Leave your answer in polar form in terms of ).
3. Find the Cartesian equation of the locus described by write your answer in the form

**QUESTION THREE**

1. If and find , leave your answer in terms of
2. If , solve for and
3. If is a complex number and , where and , solve the equation for
4. Find the values of the complex number *u* and *v* in the form given: and .
5. Describe the Cartesian equation of the locus defined by

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