Complex Numbers Test 1: Fundamentals

1. Solve the following quadratic equations by using the quadratic formula.

i)

$$z^2 + 4 = 0$$

ii)

$$z^2 - 2iz + 1 = 0$$

2. Solve the following quadratic equations by completing the square.

i)

$$z^2 - 2z + 3 = 0$$

ii)

$$2z^2 - z + 3 = 0$$

3. Without using calculator, find the value of:

i)

$$i^{103}$$

ii)

$$i^{1023}$$

4. Express in form of a+ib where a and b are real numbers.

i)

$$\frac{2 + 3i}{2 - 3i}$$

ii)

$$(5 + 2i)(3 + 4i)$$

iii)

$$(2 + 3i)^3$$

5. Find the square roots of 10+2i.

6. Solve the equation:

$$z + 2 \cdot z^* = \frac{15}{2 + i}$$

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bishaltwr@gmail.com