Edexcel Advanced Level GCE Mathematics FP1

William Bevington   Callum O'Brien   Alex Pace

Contents

1 Matrix Transformations

2 Complex Numbers

If the complex numbers z_1 and z_2 are equal, then it follows that $Re\,(z_1) = Re\,(z_2)$ and $Im\,(z_1) = Im\,(z_2)$. as demonstarated bellow:

Let $z_1 = a + bi$ and $z_2 = c + di$ where $a, b, c, d, \in \mathbb{R}$

$$z_1 = z_2 \therefore a + bi = c + di$$

$$a - c = (d - b)\,i$$

$$(a - c)^2 = (b - d)^2\,i^2 \rightarrow (a - c)^2 = -\,(d - b)^2$$

$$(a - c)^2 \geq 0 \,\&\, -\,(d - b)^2 \leq 0$$

the only overlap here is 0.

therefore, $Re\,(z_1) = Im\,(z_2)$.

2.1 Modulus Argument of Complex Numbers

These values are given when a complex number is represented in the polar form:

$$z = r\,(\cos\,(\theta) + i\sin\,(\theta))$$

where r is the modulus and θ is the argument.

From the cartesian form $z = a + bi$ the modulus and argument of a complex number can be found as follows:

$$|z| = \sqrt{a^2 + b^2}$$

$$arg\,(z) = arctan\left(\frac{b}{a}\right)$$