Analytical Geometry and Linear Algebra II, Lab 7

Complex numbers

Hermitian matrix

INNOPOLIS UNIVERSITY

Complex numbers

Representation

Rectangular form: $z = x + yi$

Example: $z = 5 + 6i$

Polar form: $z = r(cos(\theta) + sin(\theta)i)$, where

$\theta = atan2(Im(z), Re(z))$;

$r = |z| = \sqrt{x^2 + y^2}$

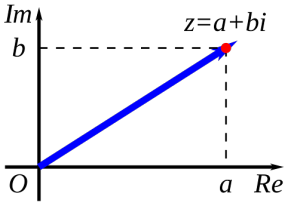
Example: $z = 8(cos(24) + sin(24)i)$

Exponential form: $z = re^{\theta i}$

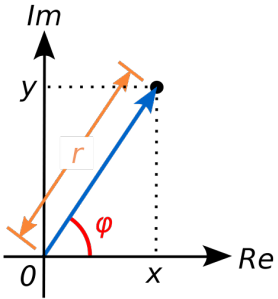
Example: $z = 6e^{2.5i}$

Transform from Exp. to Rect. form:

$$\begin{cases} Re(z) = rcos(\theta) \\ Im(z) = rsin(\theta) \end{cases}$$



Rectangular form



Polar form

Reference material

- Lecture 17
- *"Linear Algebra and Applications", pdf pages 205–221*
  Orthogonal Bases and Gram-Schmidt
- Gram-Schmidt Process | Lectures 19 and 20
  Video from Matrix Algebra for Engineers course
- QR Factorization

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– Oleg Bulichev

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Room 105 (Underground robotics lab)