MA114 : Matrices and Complex Numbers

An Introduction to complex numbers

$$x^2 = -1$$

$$i^2 = -1 \qquad i \text{ imaginary unit}$$

$$i = \sqrt{-1}$$

$2i$, $\sqrt{5}\,i = \sqrt{-5}$, $\frac{1}{2}i$ → imaginary numbers

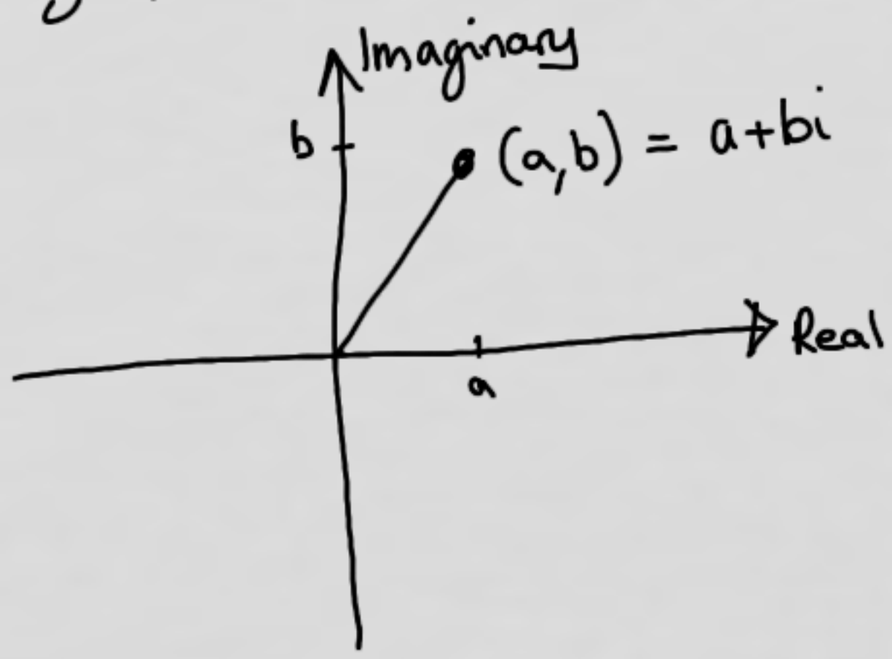
$\mathbb{C}$: A complex number is any number of the form:

$a + bi$ $\quad a, b$ real numbers $(a, b \in \mathbb{R})$

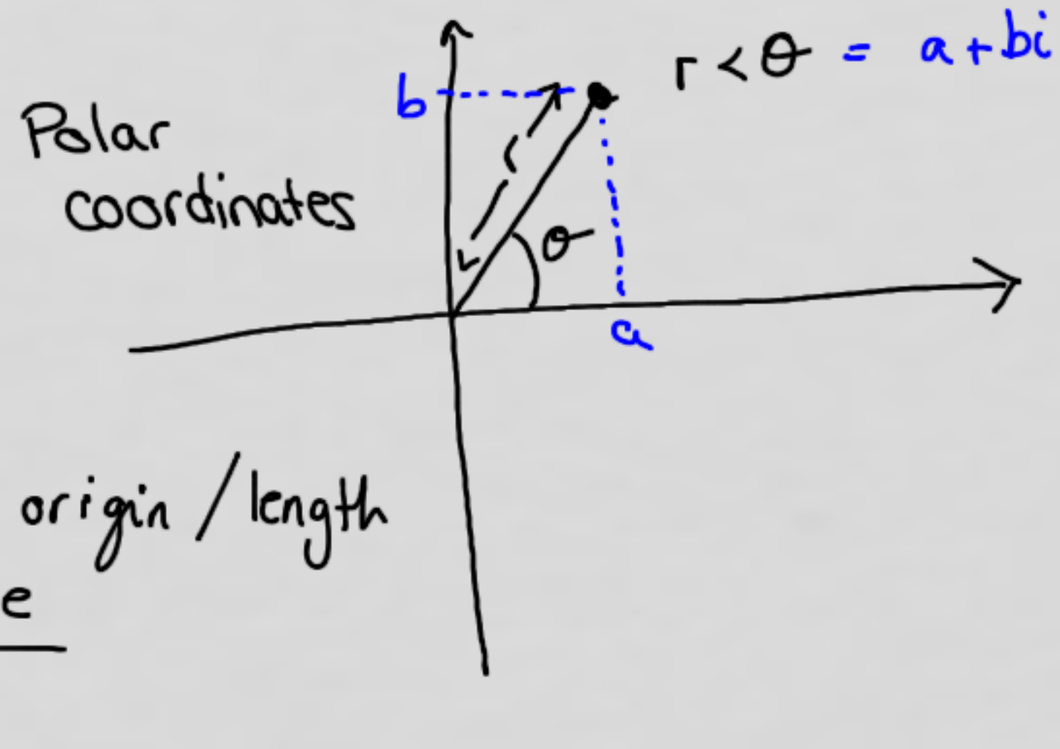
a: real part

b: imaginary part

Complex plane :



Cartesian coordinates



r : distance from origin / length

absolute value

stretch

θ : angle to the positive x-axis

argument

represent in radians or degrees

rotation

$2\pi = 360^\circ$

$\pi = 180^\circ$

$\pi/2 = 90^\circ$