MATLAB: University of California, Davis

Computer LAB for Linear Algebra   Dr. Daddel

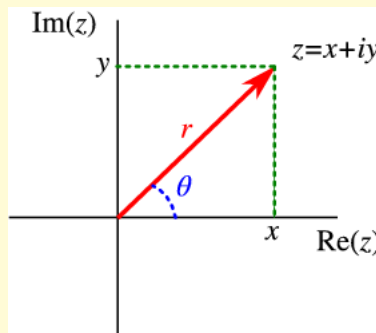## MATH 22AL   LAB # 10

6   Polar Representation of Complex numbers

A complex number in rectangular form $c = a + ib = xi + iy$ can also be represent in polar form or trigonometric form.

Simple connection between Polar and cartesian or rectangular coordinate form of representation of a point. Points in rectangular form are represented as $(a, b) = (x, y)$ and in polar coordinates as (r, θ), where $x = a = r\cos\theta$ and $y = b = r\sin\theta$. So, $c = a + ib$ can be represent as

$$c = r\cos\theta + ri\sin\theta = r(\cos\theta + i\sin\theta) = rcis(\theta)$$

The angle θ is called the argument of c denoted by $arg(c) = \theta$ and

r is called the **modulus** or **absolute value** or **magnitude** of c.

Polar coordinates representation is very useful when we multiply or divide complex numbers.