Complex numbers 复数

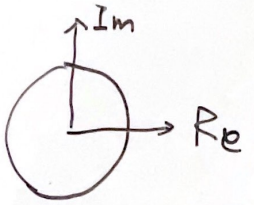
$(a+jb)$ a, b : real numbers 实部

$j = \sqrt{-1}$ imaginary unit 虚部 $x^2+1=0$

complex plane

Re (real axis)

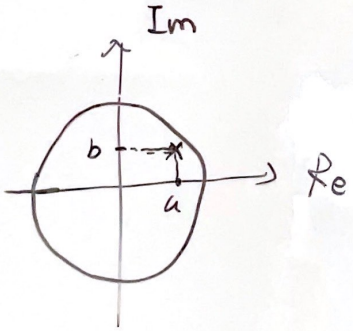
Im (imaginary axis)



单位圆

Rectangular form

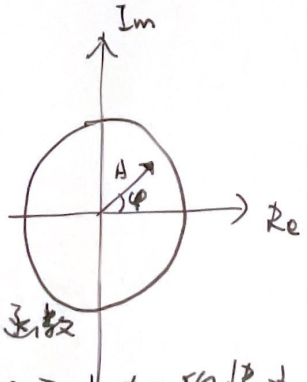
$(a+jb)$



Polar form 极坐标

$$A = \sqrt{a^2+b^2}$$

$$\varphi = \operatorname{atan2}\frac{b}{a}$$



($\operatorname{atan2} = \arctan\frac{b}{a}$ 反正切函数

但是 atan2 可以处理 $a=0$ 而 $b\neq 0$ 的情况)

where

if $(a>0)$ $\operatorname{atan2}\left(\frac{b}{a}\right) = \arctan\frac{b}{a}$

else if $(a<0)$ $\operatorname{atan2}\left(\frac{b}{a}\right) = \arctan\frac{b}{a} - \pi$