5 Modulus argument form

DONE

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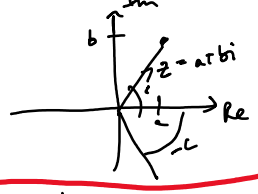
① 

$z = a+bi$

$|z| = \sqrt{a^2+b^2}$ ← Modulus

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

↳ if $z >$ Re axis
$\therefore \theta =$ +ve, ↺ clockwise

if $z <$ Re axis
$\therefore \theta =$ -ve, ↻ clockwise

② i) $z = 3+0i$

$|3| = 3$, $\arg(3) = 0$

ii) $z = -2-9i$

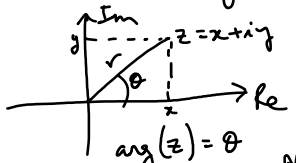
$|z| = \sqrt{2^2+9^2} = \sqrt{85}$

$\arg(z) = -\pi + \arctan\left(\frac{9}{2}\right) = -1.79^c$

iii) $z = 0+0i$

$|z| = 0$, $\arg(z)$ is undefined

③ Cartesian form → $z = x+iy$



$\arg(z) = \theta$

$|z| = r$

$\sin\theta = \frac{y}{r} \Rightarrow y = r\sin\theta$

$x = r\cos\theta$

$x+iy = r(\cos\theta + i\sin\theta)$ ← modi Arg form

$z = -8-6i$

$|z| = \sqrt{8^2+6^2} = 10$

$\arg(z) = \arctan\left(\frac{6}{8}\right) = 36.87$

$z = 10(\cos 36.87 + i\sin 36.87)$

→ $2(\cos(-3) + i\sin(-3)) = z$

$|z| = 2$

$x = 2\cos(-3) = -1.98$

$y = 2i\sin(-3) = -0.282i$

$\therefore z = -1.98-0.282i$ //