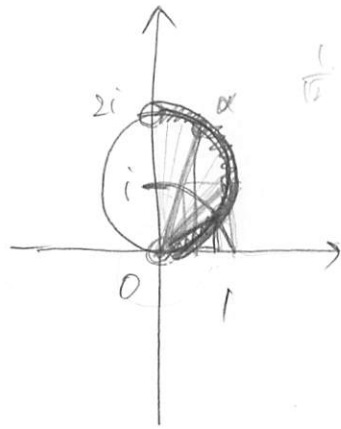


2  $\alpha \neq 0$

$|\alpha - i| = 1$

$0 < \theta < \frac{\pi}{2}$



$\alpha - \bar{\alpha}$   
 $= 2ri \sin \theta$

$\alpha \bar{\alpha} + (\alpha - \bar{\alpha})i = 0$

$r^2 + 2ri^2 \sin \theta = 0$

$r^2 - 2r \sin \theta = 0$

$r(r - 2 \sin \theta) = 0$

$r = 2 \sin \theta$

$|\alpha| = r = 2 \sin \theta //$

(1)  $|\alpha - i| = 1$

$|\alpha - i|^2 = 1$

$(\alpha - i)(\bar{\alpha} - i) = 1$

$(\alpha - i)(\bar{\alpha} + i) = 1$

$\alpha \bar{\alpha} + \alpha i + \bar{\alpha} i + 1 = 1$

$\alpha \bar{\alpha} + (\alpha - \bar{\alpha})i = 0$

$\alpha = r(\cos \theta + i \sin \theta) \quad (r > 0, 0 < \theta < \frac{\pi}{2})$

$\alpha \bar{\alpha} = r(\cos \theta + i \sin \theta) r(\cos \theta - i \sin \theta)$

$= r^2(\cos^2 \theta + \sin^2 \theta)$

$= r^2$

(2)  $\beta = -\alpha + 2i$

$0 \leq \arg \beta < 2\pi$

$\beta = -\alpha + 2i$

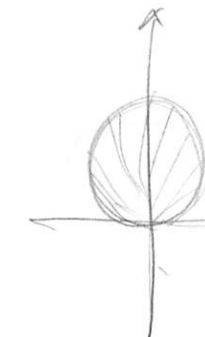
$\alpha = -\beta + 2i$

$|\alpha - i| = 1$

$|- \beta + 2i - i| = 1$

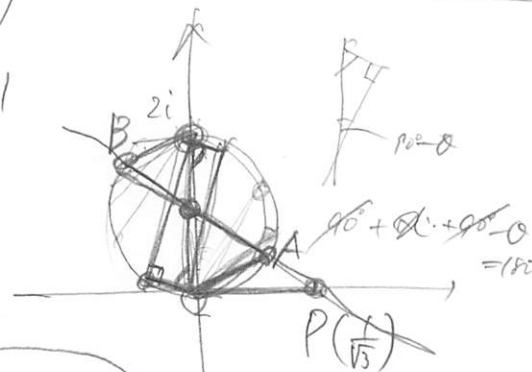
$|- \beta + i| = 1$

$|\beta - i| = 1$

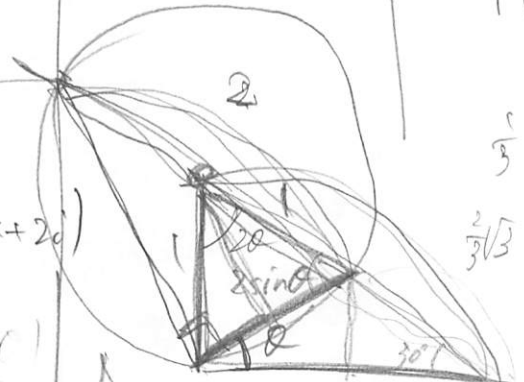


$\arg \beta = \arg(-\alpha + 2i)$

$\arg \beta = \theta + \frac{\pi}{2}$   
 $(\frac{\pi}{2} < \theta < \pi)$



(3)



$\frac{1}{3} + 1 = \frac{4}{3}$   
 $\frac{2}{3}\sqrt{3}$   
 $\frac{2}{3}$   
 $\frac{2}{3}\sqrt{3}$   
 $\frac{2}{3}$   
 $\frac{2}{3}\sqrt{3}$   
 $\frac{1}{3} = x(x+1)$

$x^2 + 3x - \frac{1}{3} = 0$

$3x^2 + 9x - 1 = 0$

$2\theta = \frac{\pi}{6}$   
 $\theta = \frac{\pi}{12}$