Nishant Jindal

$|z| = 3e^{i\frac{2\pi}{3}}$

$3 - \sqrt{3}$

$$\frac{1+z+z^2}{1-z+z^2} = \frac{1+\bar z+\bar z^2}{1-\bar z+\bar z^2}$$

$$(z-\bar z)(1-z\bar z) = 0$$

min & max value

$|z|$

$$\boxed{2\sqrt{3}-\sqrt{3}}$$

$$2\sqrt{3}+\sqrt{3}$$

$$\frac{x}{a} = a^2 - 3b^2$$

$$\frac{y}{b} = 3a^2 - b^2$$

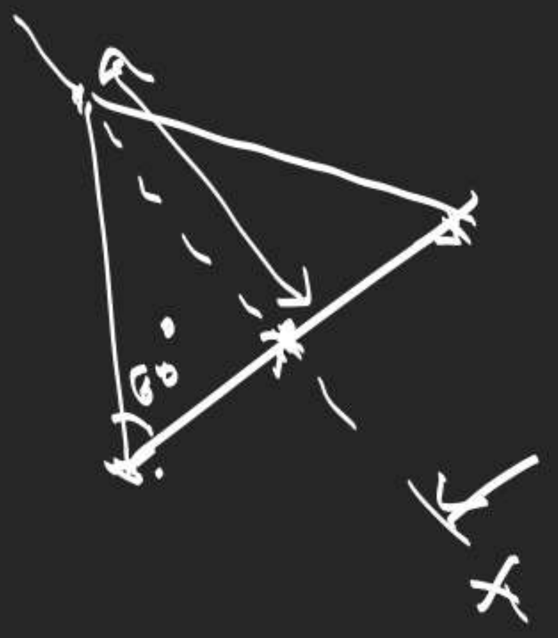
$$(1+z_1\bar z_2)(1+\bar z_1 z_2) + (z_1-z_2)(\bar z_1-\bar z_2) = 1+|z_1|^2|z_2|^2+|z_1|^2+|z_2|^2$$

$$= (1+|z_1|^2$$

$$\frac{1-z+z^2+2z}{1-z+z^2} = 1+\frac{2}{\boxed{\frac{1}{z}+z}-1}$$

$$z+\frac{1}{z} \in \mathbb{R}$$

$$z+\frac{1}{z} = \bar z+\frac{1}{\bar z}$$



$$-i\bar{z} = z^2$$

$$|z| = |z|^2 \Rightarrow |z| = 0, 1$$

$$-i|z|^2 = z^3$$

$$z^3 = 0 \quad \text{or} \quad \boxed{z^3 = -i}$$

$$\downarrow$$

$$\boxed{z = 0} \qquad z = e^{i\left(\frac{-\frac{\pi}{2}+2k\pi}{3}\right)} \qquad k = 0, 1, 2$$

$$\frac{i^{n+1} - 1}{i - 1} = \Bigg\{$$

$n = 4k$

$4k+1$

$4k+2$

$4k+3$

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$$\sqrt{i} = e^{i\left(\frac{\frac{\pi}{2}+2k\pi}{2}\right)} \quad k=0,1$$

$$\sqrt{-i} = e^{i\left(\frac{-\frac{\pi}{2}+2k\pi}{2}\right)} \quad k=0,1$$

$$\frac{i-1}{i\,2\sin^2\frac{\pi}{5} + 2\sin\frac{\pi}{5}\cdot\cos\frac{\pi}{5}} = \frac{(i-1)\left(\cos\frac{\pi}{5} - i\sin\frac{\pi}{5}\right)}{2\sin\frac{\pi}{5}}$$

$$\frac{3\pi}{4} - \frac{\pi}{5}$$

$$\frac{\sqrt{2}\, e^{i\left(\frac{3\pi}{4}-\frac{\pi}{5}\right)}}{2\sin\frac{\pi}{5}}$$

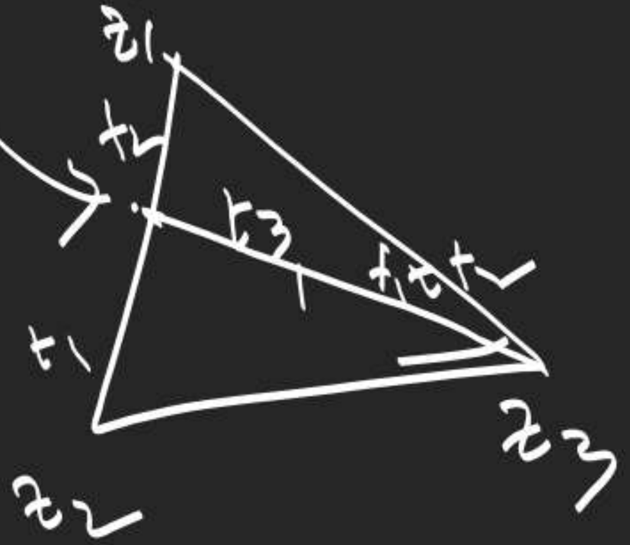
$$|z_1+1| + \underbrace{|z_2+1| + |-z_1z_2-1|} \geq |z_1+1| + |z_2-z_1z_2|$$

$$= |1+z_1| + |1-z_1|$$

$$\geq 2$$

$$\frac{t_1z_1+t_2z_2}{t_1+t_2}$$

$$\frac{\sum t_1 z_1}{\sum t_1}$$



$$a^2 = \boxed{3}, \quad a = \sqrt{3}, -\sqrt{3}$$

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$z \in P.I.$ $\quad z^5+1=(z+1)\left(z^2-2z\cos\frac{\pi}{5}+1\right)\left(z^2-2z\cos\frac{3\pi}{5}+1\right)$

$\sin 90+18$

$\boxed{z=i}$

$\boxed{z^2 \le 0}$

$|w|=1$

$1=\frac{i+1}{i+1}=\left(-2i\cos\frac{\pi}{5}\right)\left(-2i\cos\frac{3\pi}{5}\right)$

$\frac{\pi+2k\pi}{5}$

$\frac{1}{2i}\left[\frac{1}{1-\frac{e^{ix}}{3}}-\frac{1}{1-\frac{e^{-ix}}{3}}\right]$

$(a-1)t^2-4t+a+2=0$

both roots ≤ 0

$\frac{aw+b}{w-c}=z.$ $\quad a=?$

$|w|=\left|\frac{cz+b}{z-a}\right|=1$

$\left|\frac{z+\frac{b}{c}}{z-a}\right|=\frac{1}{|c|}$

$\sum_{n=0}^{\infty}\frac{e^{inx}-e^{-inx}}{2i\,3^n}=\frac{1}{2i}\left[\sum_{n=0}^{\infty}\left(\frac{e^{ix}}{3}\right)^n-\left(\frac{e^{-ix}}{3}\right)^n\right]$

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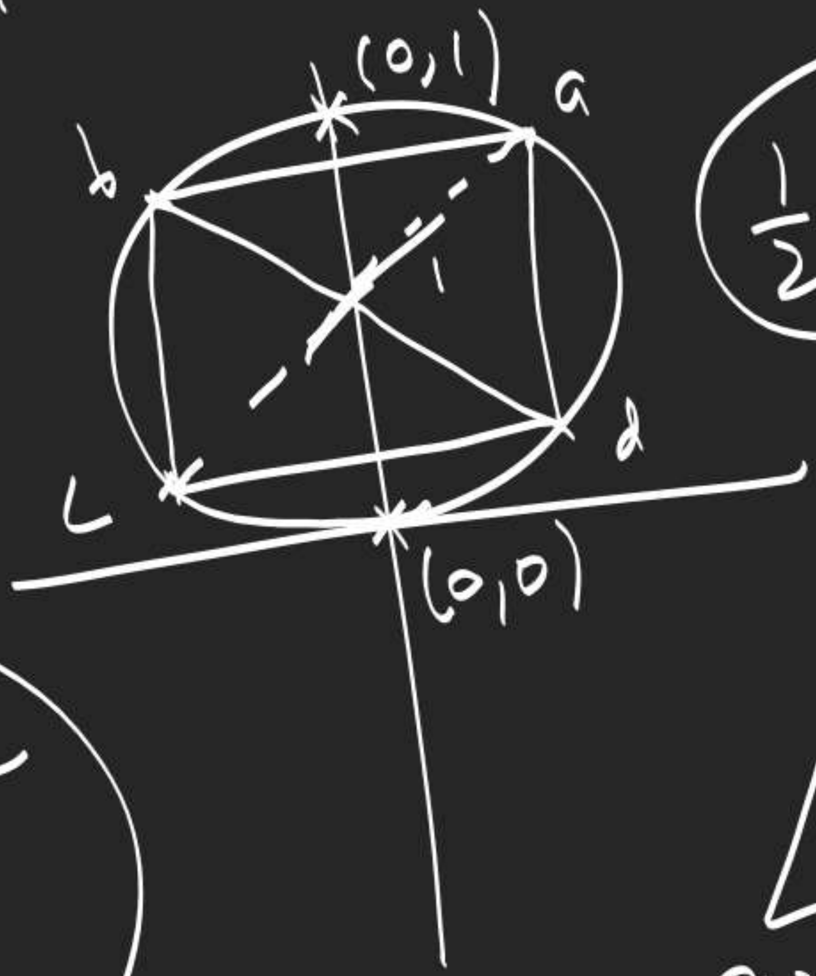
$$f(x) = \frac{x+i}{x^2+1} = \left(\frac{x}{x^2+1}, \frac{1}{x^2+1}\right) = (h, k)$$

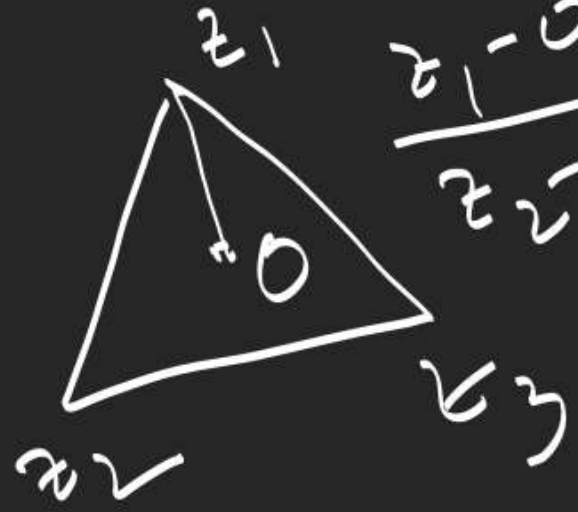
$$h^2 + k^2 = k$$



$\frac{1}{2} \times 1 \times 1$

$\Sigma x - \Pi$

$\Sigma x - \Pi$ ✓



$$\frac{z_1 - 0}{z_2 - z_3} + \frac{\bar{z}_1}{\bar{z}_2 - \bar{z}_3} = 0$$