Nishant Jindal

α
$\bar{\alpha}$
β
$\bar{\beta}$

$\alpha+\beta = 3+4i \qquad \bar{\alpha}\bar{\beta} = 13+i$

$$b = (\alpha+\beta)(\bar{\alpha}+\bar{\beta}) + \underbrace{\alpha\beta + \bar{\alpha}\bar{\beta}}$$

$$= 25 + 2(13)$$

$$\boxed{z\bar{w} = \bar{z}w}$$

$$\Uparrow$$

$$\frac{z}{w} = \frac{\bar{z}}{\bar{w}}$$

$z\bar{w}$

$$(z\bar{w}-1)(z-w) = 0 \Leftarrow z\bar{z}w - w\bar{w}z = z-w$$

$$z(1+|w|^2) = w(1+|z|^2)$$

$$\left|\frac{z}{w}\right| = \frac{1+|z|^2}{1+|w|^2}$$

$$\boxed{\frac{z}{w} \in R}$$

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$$7A_0 + xA_1\left(1+\alpha^1+\alpha^2+\cdots\alpha^6\right)$$

$$z^{2n+1} = 1$$

$$+x^2A_2\left(1^2+(\alpha^1)^2+(\alpha^2)^2+(\alpha^3)^2+\cdots(\alpha^6)^2\right)$$

$$\alpha+\beta = \sum_{k=1}^{2n} e^{\frac{i2\pi k}{2n+1}} = -1$$

$$1,\alpha,\alpha^2,\cdots,\alpha^6$$

$$\boxed{z = e^{\frac{i2\pi}{2n+1}} = e^{i\theta}}$$

$$\frac{e^{in\theta}-e^{-in\theta}}{e^{i\theta}-e^{-i\theta}}$$

$$\frac{1}{4\cos^2\left(\frac{\pi}{2n+1}\right)}$$

$$\pi - \frac{\pi}{2n+1}$$

$$7A_0 + 7A_7x^7 + 7A_{14}x^{14}$$

$$6-2\sqrt{5}$$

$$\left(\frac{\sin\frac{\pi}{2n+1}}{\sin\frac{2\pi}{2n+1}}\right)^2 = \left(\frac{\sin\left(\frac{2\pi n}{2n+1}\right)}{\sin\frac{2\pi}{2n+1}}\right)^2$$

$$\alpha\beta = z\left(1+z^2+z^4+\cdots z^{2n-2}\right)^2$$

$$= z^3\left(\frac{z^{2n}-1}{z^2-1}\right)^2 = z^{2n+1}\left(\frac{z^n-\frac{1}{z^n}}{z-\frac{1}{z}}\right)^2$$