$propiedades z, w \in \mathbb{C}$ 1) $|z+w| \leq |z| + |w|$ (des. triangular)
cumple tambien

$$\rightarrow \sqrt[2]{3} hola \frac{e^{\pi i}}{3} \rho_3 2 \tag{1}$$

n en el espacio euclideo R^4
2) $|z| - |w| \leq |z-w|$ $|z| = |(z-w)+w| \leq |z-w| + |w|$
$Cor : |w| - |z| \leq |z-w| \Rightarrow ||z| - |w|| \leq |z-w|$
$z = x + iy, x, y \in R \Rightarrow Real : z = x$ $Imag : z = y$ 3)$|Rez| \leq |z|, |Imz| \leq |z|$
4)$|\overline{z}| = |z|, |z^n| (\forall n \in Z)$ 5)$Rez = \frac{z+\overline{z}}{2}, Imz = \frac{z+\overline{z}}{2i}$ $\frac{z+\overline{z}}{2i} = \frac{(x+iy)-(x-iy)}{2i} = \frac{2iy}{2i} = y = Imz \in R$ 6)$|zw| = |z| * |w|$ $z = re^{i\theta}, w = \rho e^i \Rightarrow$
7)$arg(zw) = arg(z) + arg(w)$ $(dibujito)$ 8)$arg(\frac{1}{z}) = arg(\overline{z}) = -arg(z)$ $(dibujito)$ 9)$arg(z^n) = narg(z)$
RAICES DE NUMEROS COMPLEJOS
$z \in C, z \neq 0$
$W^n - z = 0$
$nsolucionesW_0, ...W_{n-1}$
$W^n = z$ $z = \pi e^{i*\theta} 0 < \pi < \text{ínf}, \theta \in R$ $w = \rho e^{i\phi}$ $Tenemosqueresolverenp, \phi :$ $(\rho e^{ie})^n = re^{i\theta}$.
$\rho^n e^{in\phi} = re^{i\theta}$
$\rho^n = r$ $n\phi = \theta + rK\pi, paraalgunk \in Z$
$\rho = \sqrt{r} > 0 (raizn)$
$Bastacoger : k = 0, 1, ...n-1$
$Respuesta$
$z = re^{i\theta} \rightarrow \sqrt{z} = \sqrt{r} e^{i* \frac{\theta + 2k\pi}{n}} (raicesdegradon)$
$k = 0, 1, ..., n-1$
$(dibujito)$
$z = 2i3\sqrt{z} =?$
$Obtenemosvalores :$
$3\sqrt{2i} = W_k, k = 0, 1, 2.$
$W_k = 3\sqrt{2} * e^{i* \frac{\theta + 2k\pi}{n}}$
$k = 0, 1, 2.$
$argW_0 = (\pi/2)/3 = \frac{\pi}{6} = 30$
$argW_1 = (\pi/6) + (2\pi/3) = 150$
$argW_2 = (\pi/6) + (4\pi/3) = 270$
$Lasraicesn - esimasde1 :$
$n\sqrt{1} = \{\epsilon ... \epsilon_{n-1} 1 = 1e^{i\theta}$
$\epsilon_k = e^{i \frac{2\pi k}{n}}, k = 0, 1, ..., n-1$
$n = 5 :$
$(dibujo)$
$Propiedades : 1) f < ormanungrupoconmutativorespectodelproducto.$
$\epsilon_k \epsilon_e = \{\epsilon_{k+e}, k+l \in n$ $\epsilon_{k+l-n}, k+l \geq n$

$(estegrupoesisomorfoaZ_n)$

$2)We sunadelasraicesenesimasdez(w_n = z) \rightarrow todaslasraicesn-esimasdezsonW_k = W\epsilon_k, k = 0, ..., n-1$

$3)W_0, ...W_{n-1}, todassonraicesn-esimasdez, n \leq 2 \rightarrow W_0 + ... + Wn - 1 = 0$

$(dibujitodeunpentagono)$

$e^{i\phi} = cos\phi + isen\phi$

$\underline{Def}Dadaunaserie$

$\overline{2a_n} = a_0 + a_1 + ...a_n$

$\underline{Def} \sum(de \inf an = 0)a_n = lim(n- > \infty)S_n$

$\overline{Laserieconvergesi}\exists lim(n- > \infty)S_n$

$Tenemosqueresolveren$