

1. FORMA ALGÉBRICA

1.1. DEFINIÇÃO: $z = a + bj$; ONDE $a \in \mathbb{R}$
 $b \in \mathbb{R}$
 $j = \sqrt{-1}$

1.2. CONJUGADO: $\bar{z} = a - bj$

1.3. OPERAÇÕES

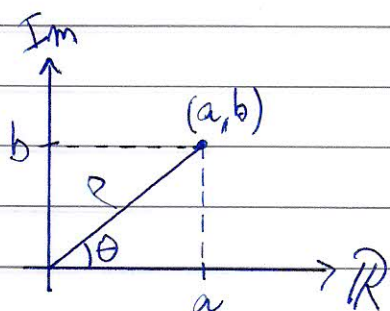
DADOS: $z_1 = a + bj$; $z_2 = c + dj$

ADIÇÃO: $z_1 + z_2 = (a + c) + (b + d)j$

SUBTRAÇÃO: $z_1 - z_2 = (a - c) + (b - d)j$

2. FORMA TRIGONOMÉTRICA OU POLAR

SENDO $z = a + bj$



$$|z| = \rho$$

$$\rho = \sqrt{a^2 + b^2}$$

$$\theta = \operatorname{tg}^{-1} \frac{b}{a} = \operatorname{arctg} \frac{b}{a}$$

$$z = \rho (\cos \theta + i \cdot \operatorname{sen} \theta)$$

ou...

$$z = \rho / \theta$$

2.1 OPERAÇÕES

DADOS: $z_1 = \rho \angle \theta$; $z_2 = v \angle \beta$

MULTIPLICAÇÃO: $z_1 \cdot z_2 = \rho \cdot v \angle \theta + \beta$

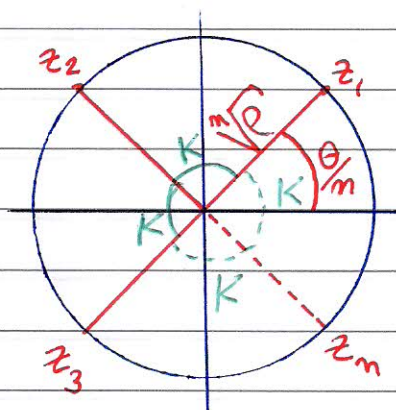
DIVISÃO: $\frac{z_1}{z_2} = \frac{\rho}{v} \angle \theta - \beta$

POTENCIAÇÃO: $(z_1)^n = \rho^n \angle n\theta$

RADICAÇÃO: $\sqrt[n]{z_1} = \sqrt[n]{\rho} \angle \theta/n$

INVERSO: $z_1^{-1} = \rho^{-1} \angle (-1)\theta$

OBS: n-ÉSIMA RAIZ DE UM COMPLEXO $\sqrt[n]{z}$



$$K = \frac{360^\circ}{n}$$

3. EXEMPLOS

$$\text{DADOS: } z_1 = 2 + 5j ; z_2 = 3 - 7j$$

$$\text{A) } z_1 + z_2 = (2+3) + (5-7)j = 5 - 2j$$

$$\text{B) } z_2 - z_1 = (3-2) + ((-7)-5)j = 1 - 12j$$

C) POLAR DE z_1

$$\rho = \sqrt{2^2 + 5^2} = 5,39$$

$$\theta = \operatorname{tg}^{-1} \frac{5}{2} = 68,2^\circ$$

$$z_1 = 5,39 \angle 68,2$$

D) POLAR DE z_2

$$\rho = \sqrt{3^2 + (-7)^2} = 7,62$$

$$\theta = \operatorname{tg}^{-1} \frac{(-7)}{3} = -74,1^\circ$$

$$z_2 = 7,62 \angle -74,1$$

$$\text{E) } z_1 \cdot z_2 = 5,39 \angle 68,2 \cdot 7,62 \angle -74,1 = 41,07 \angle -5,9$$

$$\text{F) } \frac{z_2}{z_1} = \frac{7,62}{5,39} \angle -74,1 - 68,2 = 1,41 \angle -142,3$$

matéria

data

$$G) (z_1)^3 = (5,39)^3 / 3.682 = 156,6 / 204,6$$

$$H) \sqrt[3]{z_2} = \sqrt[3]{7,62} / -74,1/3 = 1,97 / -24,7$$

$$K = \frac{360}{3} = 120$$

$$I) 1,97 / -24,7$$

$$II) 1,97 / 95,3$$

$$III) 1,97 / 215,3$$

+K

+K