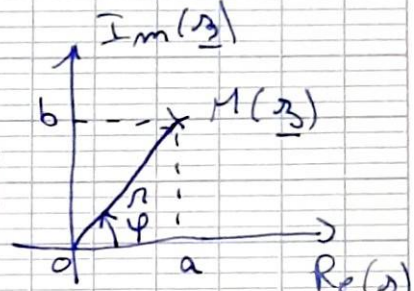
chap. 0 : Rappels Maths

I - nb cmplx.

$\underline{z} = \underbrace{a + j \cdot b}_{\text{rectangul. / cartesienne}} = \underbrace{r e^{j\varphi}}_{\text{polaire / exponentielle}}$ $\quad j^2 = -1$

$\underline{z} = r(\cos\varphi + j \sin\varphi)$

↳ $a = r \cdot \cos\varphi$ → partie IR
$b = r \cdot \sin\varphi$ → " Im
$r = \sqrt{a^2 + b^2}$ → module
$\varphi = \arctan\left(\frac{b}{a}\right)$ → argument



Plan cmplx

II - Proprietes nb cmplx

- $\underline{z_3} = \underline{z_1} \cdot \underline{z_2} = r_1 \cdot r_2 \cdot e^{j(\varphi_1 + \varphi_2)}$ ⇒ $r_3 = r_1 r_2$; $\varphi_3 = \varphi_1 + \varphi_2$.

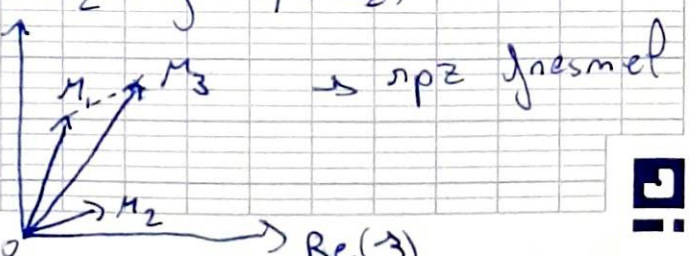
- $\underline{z_3} = \frac{\underline{z_1}}{\underline{z_2}}$ ⇒ $r_3 = \frac{r_1}{r_2}$; $\varphi_3 = \varphi_1 - \varphi_2$

↳ $\frac{a + jb}{c + jd} = \frac{(a + jb)(c - jd)}{c^2 + d^2} = \frac{ac + bd + j(bc - ad)}{c^2 + d^2}$

↳ $a_3 = \frac{ac + bd}{c^2 + d^2}$; $b_3 = \frac{bc - ad}{c^2 + d^2}$

- $\underline{z_3} = \underline{z_1} + \underline{z_2} = a_1 + a_2 + j(b_1 + b_2)$

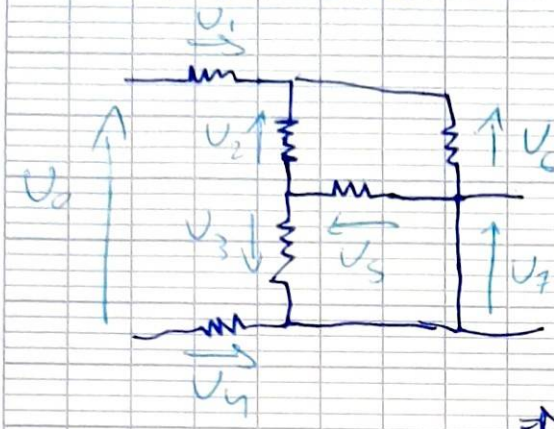
⚠ $r_3 \neq r_1 + r_2$
$\varphi_3 \neq \varphi_1 + \varphi_2$



→ rpz Fresnel

III - Lois electricité

. lois des mailles.



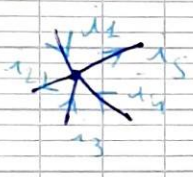
$U_4 = 0$

Ds une maille :

$$\sum_i U_i = 0$$

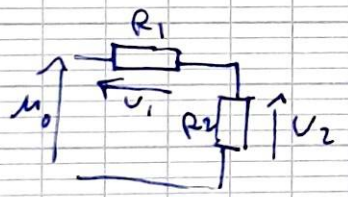
$$\Rightarrow U_0 + U_1 - U_2 + U_3 - U_4 = 0$$
$$\Rightarrow U_2 - U_c - U_3 = 0$$

. lois des noeuds



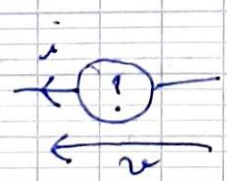
$$i_1 + i_4 + i_3 = i_2 + i_5$$

. pont div de tense



$$u_2 = u_0 \cdot \frac{R_2}{R_1 + R_2}$$

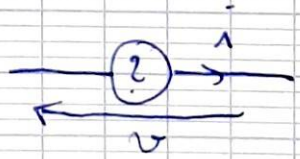
. convent° gen / rec.



generateur

puiss fournie

$P = v \cdot i > 0$



recepteur

puiss reçue

$P = v \cdot i > 0$