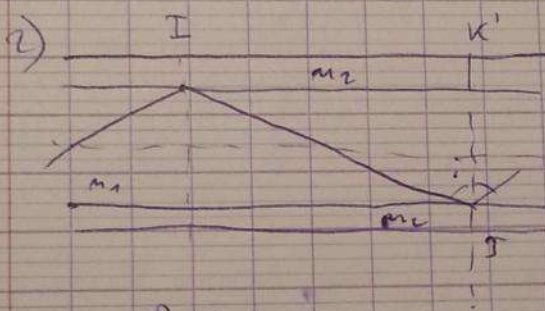


Ex 1.

1) L'angle limite de réfraction : i_c

$$n_1 \sin i_c = n_2 \sin 90^\circ$$

$$i_c = \arcsin\left(\frac{n_2}{n_1}\right) = 72,5^\circ$$

Réflexion totale lorsque $i > i_c$ 

Avec Pythagore

$$a = 3,62 \text{ km}$$

$$\cos(i) = \frac{JK}{IJ} = \frac{a}{d}$$

$$3) L' = \frac{IJ}{IK} L = 7320 \text{ km}$$

Temps de parcours Paris-NY avec $v = \frac{c}{n_1}$

$$\tau = \frac{L'}{v} = 37 \mu\text{s}$$

$$4) D = 2 \times \sqrt{h^2 + \left(\frac{L}{2}\right)^2} \approx 37165 \times 2 = 74300 \text{ km}$$

$$\Rightarrow T = \frac{D}{c} \approx 250 \mu\text{s}$$

$$\frac{T}{\tau} = 7$$

Ex 2:

$$1) P_R = \frac{P_E}{4\pi R^2} = \frac{100}{4\pi(3600000)^2}$$
$$= \text{W/m}^2$$

$$2) P_R = \frac{P_E \times G_E}{4\pi R^2}$$

$$G_E = \frac{P_R \times 4\pi R^2}{P_E}$$

$$= \frac{0,97 \times 10^{-10} \times 4 \times \pi \times R^2}{100}$$

$$G_{E_{dB}} = 10 \log(G_E)$$

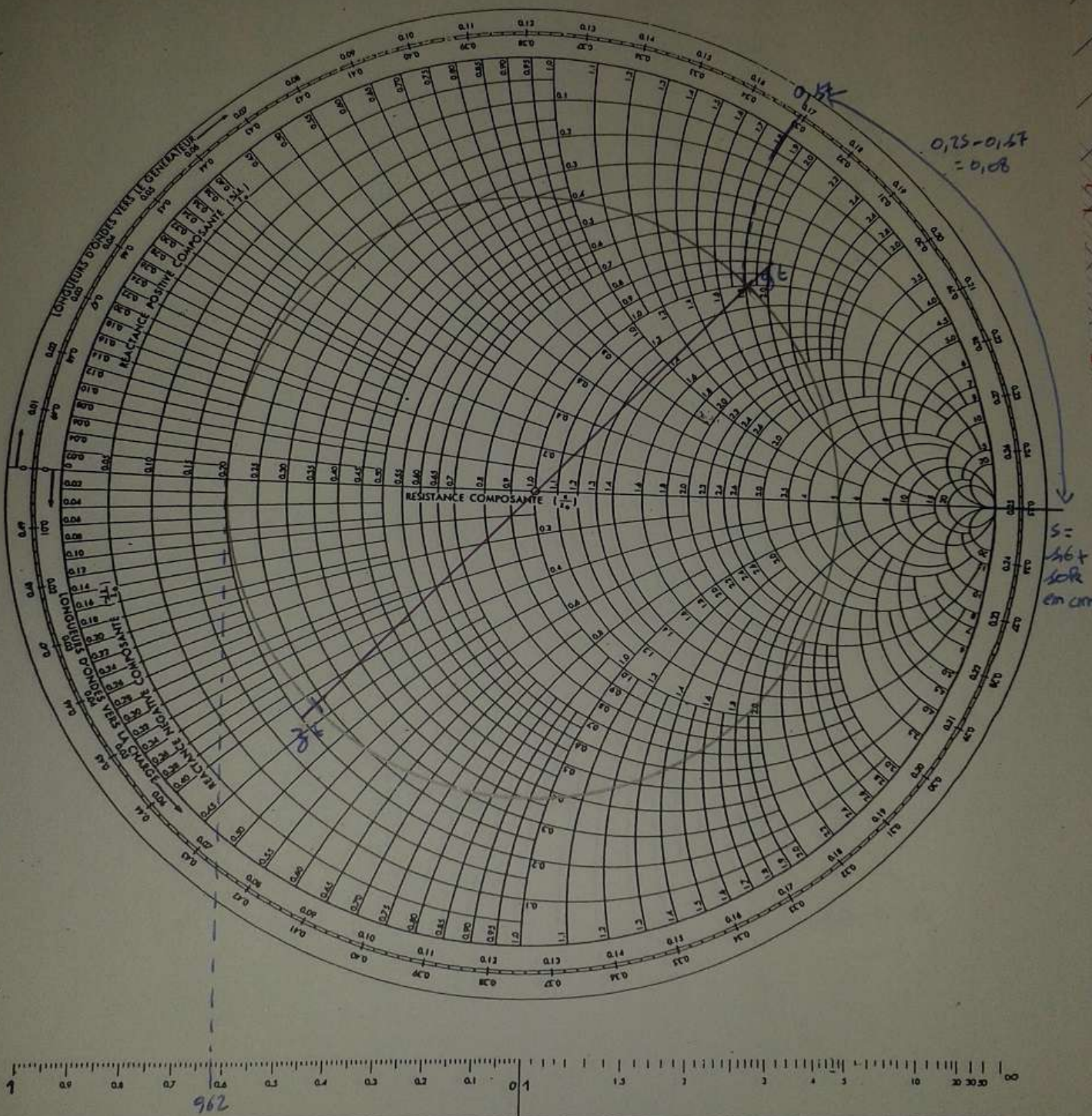
$$3) P_{IRE} = P_E \times G_E$$

$$4) P_{17}$$

$$G = \frac{4\pi S}{\lambda^2}$$

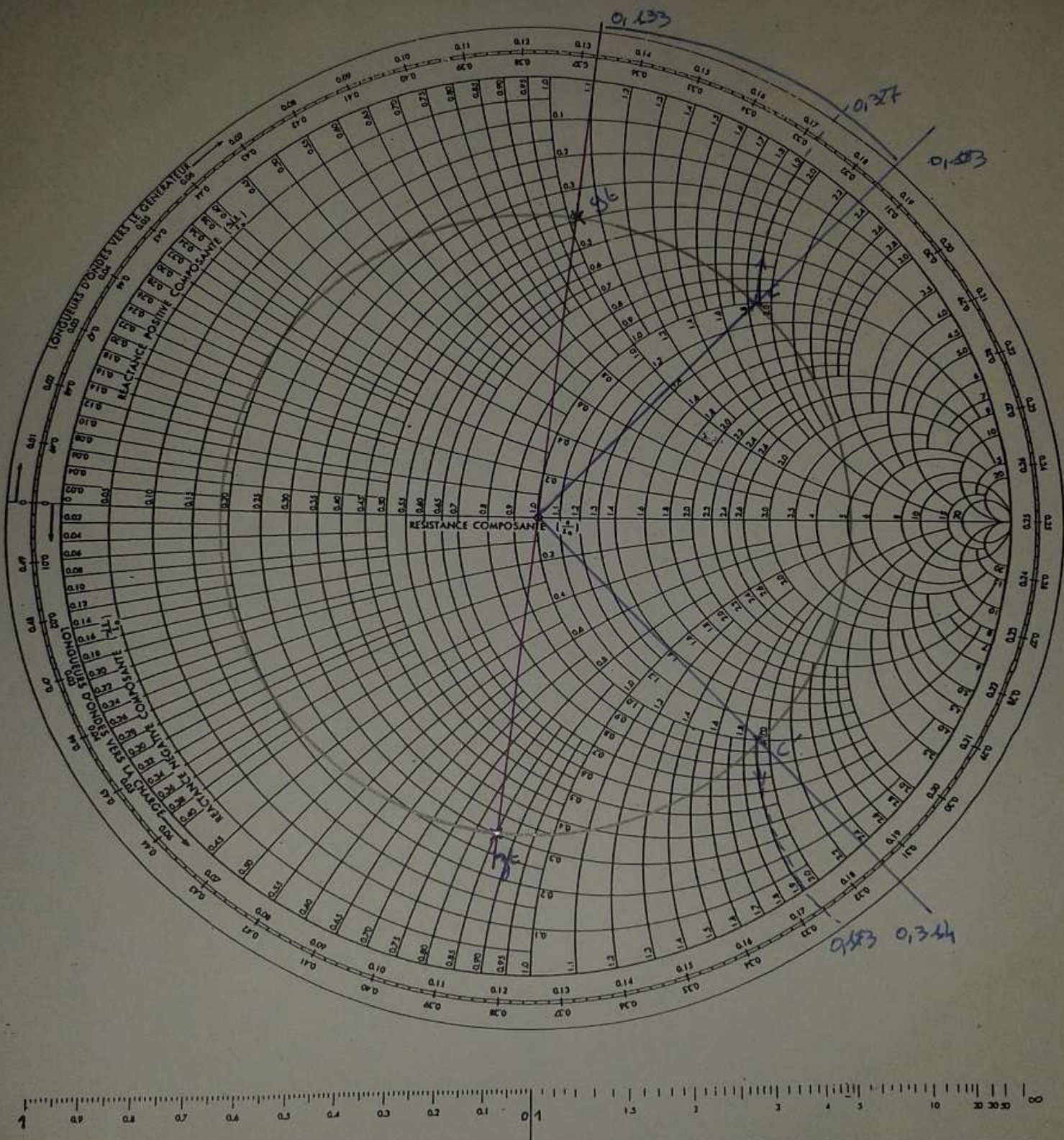
$$\Rightarrow S = \frac{\lambda^2 G}{4\pi}$$

Exercice 1



$$\rho = |r|$$

ABAQUE DE SMITH


$$\rho = |\Gamma|$$

ROS

ABAUUE DE SMITH