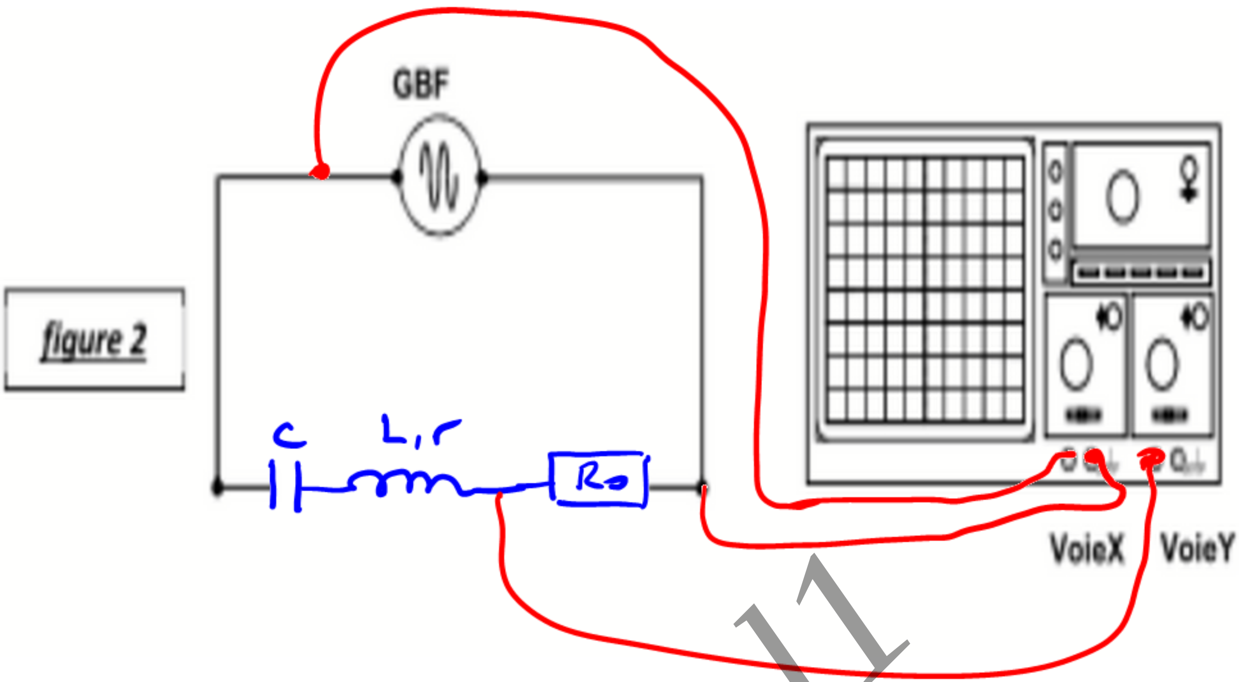
1.



2.

$U_m = Z I_m$ avec $Z = \sqrt{(R+r)^2 + \left(L\omega - \frac{1}{C\omega}\right)^2}$

$U_{R_m} = R I_m$.

$\boxed{Z > R \Leftrightarrow U_m > U_{R_m}}$ ⇒ la courbe qui a l'amplitude la plus grande représente $u(t)$ ⇒ $\mathcal{C}_1$ représente $u(t)$.

3 a. $\boxed{N_1 =} \frac{1}{T} = \frac{1}{6\pi.10^{-3}} = \boxed{53,05 \text{ Hz}}$.

b. $U_m = 2 \times 5 = 10 \text{ V}$

$U_{R_m} = 3 \times 1 = 3 \text{ V}$

c. $|\Delta\varphi| = \omega . \Delta t = \frac{2\pi}{T} . \frac{T}{6} = \frac{\pi}{3}$ rad.

or $u(t)$ atteint son maximum avant $u_R(t)$ $\Rightarrow$ $u(t)$ est en avance de phase p/r à $u_R(t)$ $\Rightarrow$ $\boxed{\varphi_u - \varphi_{u_R} = \frac{\pi}{3} \text{ rad}}$.

$u_R(t) = R_0\, i(t) \Leftrightarrow \varphi_{u_R} = \varphi_i \Rightarrow \boxed{\varphi_i - \varphi_u = -\frac{\pi}{3} \text{ rad}}$

$\Rightarrow$ $i(t)$ est en retard de phase p/r à $u(t)$ alors le $\boxed{\text{circuit est inductif.}}$

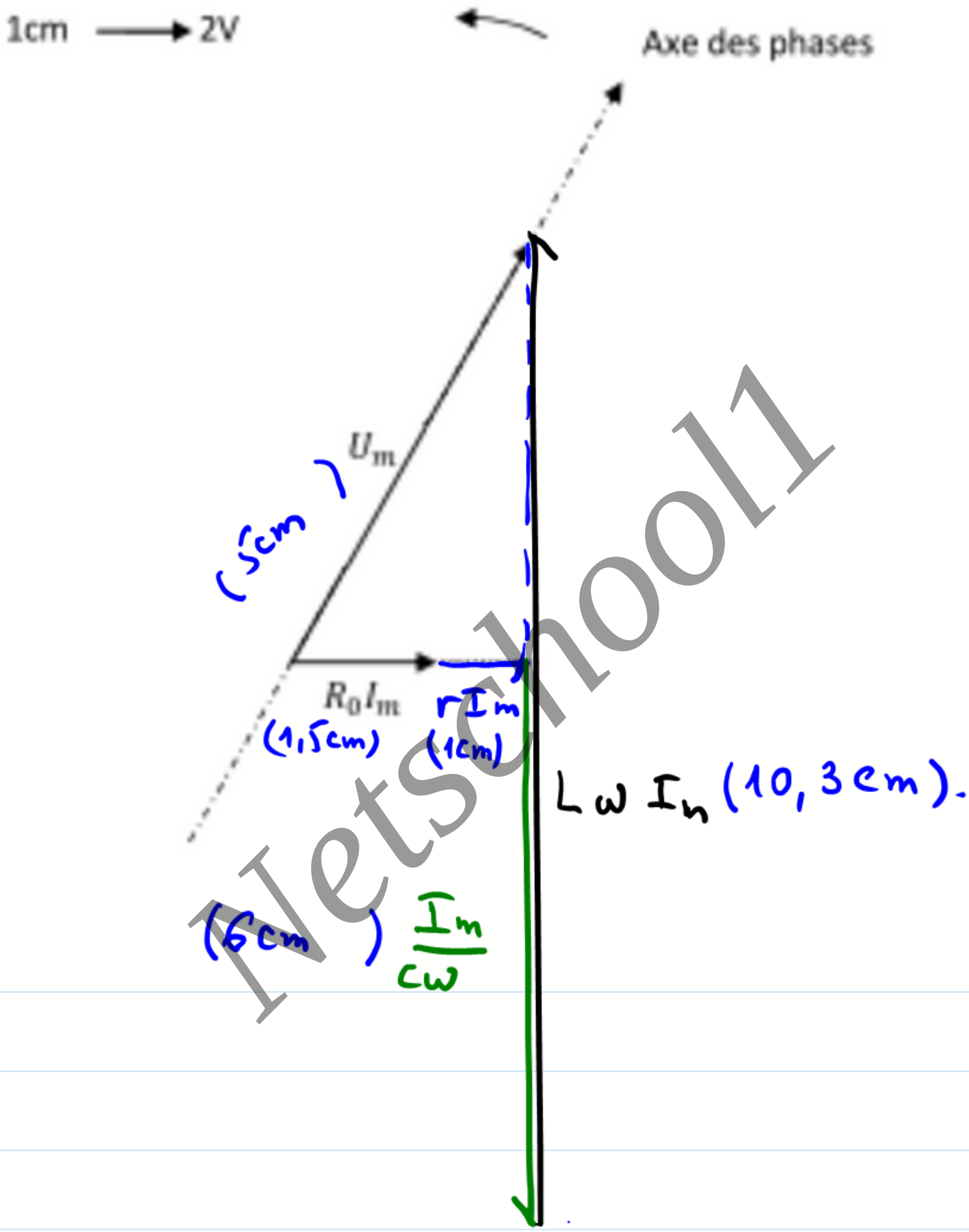
4. $\boxed{I_m =} \frac{U_{R_m}}{R_0} = \frac{3}{30} = \boxed{0,1 \text{ A}}$.

$\boxed{Z =} \frac{U_m}{I_m} = \frac{10}{0,1} = \boxed{100\ \Omega}$.

5a.

$$U_{cm} = \frac{I_m}{C\omega} = \frac{0,1}{25.10^{-6} \times 2\pi \times 53,05} = 12 \text{ V}$$

$U_{cm} \longrightarrow 6$ cm.



b. $rI_m \longrightarrow 1\,cm \Rightarrow rI_m = 2\,V$

$\boxed{r =} \frac{2}{I_m} = \boxed{20\,\Omega}$.

* $L\omega I_m = 20{,}6\ V \Rightarrow L = \dfrac{20{,}6}{\omega I_m}$

$$\boxed{L =} \frac{20{,}6}{2\pi \times 53{,}03 \times 0{,}1} = \boxed{0{,}62\ H.}$$

Rq : $\cos(\varphi_i - \varphi_u) = \dfrac{R_0 + r}{Z} \Rightarrow r = Z\cos\Delta\varphi - R_0$

$$tg(\varphi_i - \varphi_u) = \frac{\frac{1}{C\omega} - L\omega}{R_0 + r}$$

$$\Rightarrow L = \frac{1}{C\omega^2} - \frac{R_0 + r}{\omega}\, tg(\varphi_i - \varphi_u) = 0{,}62\ H.$$