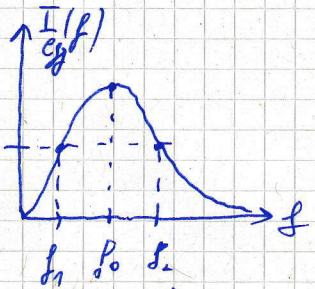
13.65 $U_{eff} = 26,0\,V$ $R = 108\,\Omega$ $C = 2,00 \cdot 10^{-7}\,F$

$I_{eff} = 0,141\,A$ $L = 5,42 \cdot 10^{-3}\,H$



$$I_{eff} = \frac{U_{eff}}{Z} = U_{eff} \cdot \left[R^2 + \left(\omega L - \frac{1}{\omega C}\right)^2\right]^{-1/2}$$

$$\sqrt{R^2 + \left(\omega L - \frac{1}{\omega C}\right)^2} = \frac{U_{eff}}{I_{eff}} = Z$$

↓ on élève au carré

$\omega L < \frac{1}{\omega C}$ → f_1 ; $\omega L = \frac{1}{\omega C}$ → f_0 ; $\omega L > \frac{1}{\omega C}$ → f_2

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

↓ $-R^2$

$$\left(\omega L - \frac{1}{\omega C}\right)^2 = Z^2 - R^2$$

↓ $\sqrt{\ }$

$$\omega L - \frac{1}{\omega C} = \pm\sqrt{Z^2 - R^2}$$ ("+" = f_2 // "−" = f_1)

↓ $\cdot\,\omega$

$$\omega^2 L - \frac{1}{C} = \pm\sqrt{Z^2 - R^2}\,\omega$$

↓ forme canonique

$$\omega^2 L \pm \sqrt{Z^2 - R^2}\,\omega - \frac{1}{C} = 0$$

↓ $\div L$

$$\omega^2 \pm \frac{\sqrt{Z^2 - R^2}}{L}\omega - \frac{1}{LC} = 0$$

$$\omega_{1,4} = \frac{\pm\sqrt{Z^2 - R^2}/L \pm \sqrt{\left(\frac{Z^2 - R^2}{L^2} + \frac{4}{LC}\right)}}{2}$$

$Z^2 - R^2 = (A)$

$\sqrt{\Delta} = (B)$

$\frac{\sqrt{Z^2 - R^2}}{L} = (C)$

++	$4,71 \cdot 10^4\ \frac{rad}{s}$
+−	< 0
−+	$1,96 \cdot 10^4\ \frac{rad}{s}$
−−	< 0

Les réponses possibles sont : $f_1 = 3,11 \cdot 10^3\,Hz \;\hat{=}\; 1,96 \cdot 10^4\ \frac{rad}{s}$

$f_2 = 7,50 \cdot 10^3\,Hz \;\hat{=}\; 4,71 \cdot 10^4\ \frac{rad}{s}$