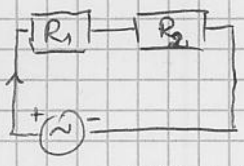
(13.42) $u_{eff} = 12V$; $R_1 = R_2 = 47\,\Omega$

a). $f \to \infty$

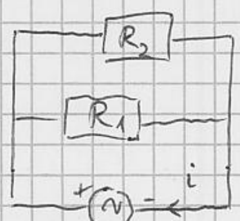


Si $f \to \infty$, $Z_C \to 0$ et $Z_L \to \infty$

$Z_C \to 0$: circuit fermé ; $Z_L \to \infty$: circuit ouvert

$$\Rightarrow I_{eff} = \frac{u_{eff}}{R_{Total}} = \frac{12V}{94\Omega} \cong \underline{\underline{0,128\,A}}$$

b). $f \to 0$



Si $f \to 0$, $Z_C \to \infty$ et $Z_L \to 0$

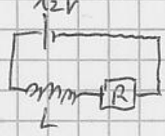
$Z_C \to \infty$: circuit ouvert ; $Z_L \to 0$: circuit fermé

$$\frac{1}{R_{équ}} = \frac{1}{R_1} + \frac{1}{R_2} = \frac{1}{47} + \frac{1}{47} = \frac{2}{47} \quad \Rightarrow R_{équ} = \frac{47}{2} = 23,5\,\Omega$$

$$\Rightarrow I_{eff} = \frac{u_{eff}}{R_{équ}} = \frac{12V}{23,5\Omega} \cong \underline{\underline{0,51\,A}}$$

(13.43) • tension constante : L n'a aucun effet ! $\Rightarrow$ permet de déterminer R

12V

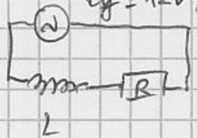


$$\hat{I} = \frac{12}{R}\sqrt{2} \Rightarrow R = \frac{12\sqrt{2}}{\hat{I}} = \frac{12}{I_{eff}} \quad (1)$$

(avec $\sqrt{2} \cdot u_{eff} = \hat{u}$)

• tension variable

$u_{eff} = 12V / f = 1500\,Hz$



$$Z = \frac{\hat{u}}{\frac{1}{3}\hat{I}} = \frac{u_{eff}}{\frac{1}{3}I_{eff}} = \sqrt{R^2 + (2\pi f L)^2} = \frac{36}{I_{eff}} \quad (2)$$

& (1) : $I_{eff} = \frac{12}{R}$ $\Rightarrow$ dans (2) : $\sqrt{R^2 + (2\pi\, 4,2)^2} = \frac{36R}{12} = 3R$

$$\Rightarrow R^2 + (8,4\pi)^2 = 9R^2$$

$$\Rightarrow 8R^2 = (8,4\pi)^2$$

$$\Rightarrow R = \sqrt{\frac{(8,4\pi)^2}{8}} \cong \underline{\underline{9,3\,\Omega}}$$

(13.44) • fréquence zéro : $Z_0 = \frac{\hat{u}}{\hat{I}_0} = R = 16 \Rightarrow \hat{I}_0 = \frac{\hat{u}}{16}$

• fréquence f : $Z_f = \frac{\hat{u}}{\hat{I}_f} = \sqrt{R^2 + (2\pi f L)^2} = \frac{\hat{u}}{\frac{1}{2}\hat{I}_0} = 2 \cdot \frac{\hat{u}}{\hat{I}_0} = 32$

$$\Rightarrow R^2 + (2\pi f L)^2 = 32^2$$

$$16^2 + \left(2\pi f \frac{4}{1000}\right)^2 = 32^2 \Rightarrow \left(2\pi f \frac{4}{1000}\right)^2 = 32^2 - 16^2 \Rightarrow f = \frac{\sqrt{32^2 - 16^2}}{\left(2\pi \cdot \frac{4}{1000}\right)} \cong \underline{\underline{1103\,Hz}}$$