Train simple ⋆

A3-05

C2-06

Question 1 Tracer le graphe des liaisons.

Question 2 Déterminer ω_{40} en fonction de ω_{30} et ω_{10}.

En bloquant le porte satellite, on a : $\frac{\omega_{43}}{\omega_{13}} = \frac{Z_1 Z_{22}}{Z_{21} Z_4}$. On a donc, $\frac{\omega_{40}+\omega_{03}}{\omega_{10}+\omega_{03}} = \frac{Z_1 Z_{22}}{Z_{21} Z_4}$ $\Leftrightarrow \omega_{40} + \omega_{03} = \frac{Z_1 Z_{22}}{Z_{21} Z_4}(\omega_{10} + \omega_{03}) \Leftrightarrow \omega_{40} = \frac{Z_1 Z_{22}}{Z_{21} Z_4}(\omega_{10} - \omega_{30}) + \omega_{30} \Leftrightarrow \omega_{40} = \frac{Z_1 Z_{22}}{Z_{21} Z_4}\omega_{10} + \left(1 - \frac{Z_1 Z_{22}}{Z_{21} Z_4}\right)\omega_{30}$.

Question 3 On suppose que ω_{40} est bloqué. Exprimer le rapport $\frac{\omega_{30}}{\omega_{10}}$.

$\Leftrightarrow 0 = \frac{Z_1 Z_{22}}{Z_{21} Z_4}\omega_{10} + \left(1 - \frac{Z_1 Z_{22}}{Z_{21} Z_4}\right)\omega_{30} \Leftrightarrow \frac{Z_1 Z_{22}}{Z_{21} Z_4}\omega_{10} = -\left(1 - \frac{Z_1 Z_{22}}{Z_{21} Z_4}\right)\omega_{30} \Leftrightarrow \frac{\omega_{30}}{\omega_{10}} = \frac{\frac{Z_1 Z_{22}}{Z_{21} Z_4}}{\frac{Z_1 Z_{22}}{Z_{21} Z_4} - 1} = \frac{Z_1 Z_{22}}{Z_1 Z_{22} - Z_{21} Z_4}$.