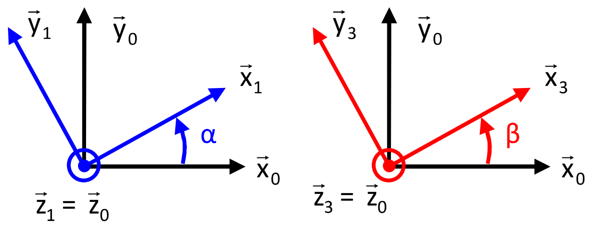
Robocoaster

Modélisation et comportement géométrique d'un mécanisme



Fermeture géométrique : $\boxed{\overrightarrow{CC} = \overrightarrow{CA} + \overrightarrow{AB} + \overrightarrow{BC} = \lambda(t).\vec{y}_1 - L.\vec{y}_3 - H.\vec{y}_0 = \vec{0}}$

En projection dans 0 : $\boxed{\begin{cases} -\lambda(t).\sin\alpha + L.\sin\beta = 0 \\ \lambda(t).\cos\alpha - L.\cos\beta - H = 0 \end{cases}}$

Q.10. Déterminer la loi entrée sortie du système de la forme λ(t) = f(β).

$$\begin{cases} -\lambda(t).\sin\alpha + L.\sin\beta = 0 \\ \lambda(t).\cos\alpha - L.\cos\beta - H = 0 \end{cases} \rightarrow \begin{cases} \lambda(t).\sin\alpha = L.\sin\beta \\ \lambda(t).\cos\alpha = L.\cos\beta + H \end{cases} \rightarrow \boxed{\lambda^2(t) = L^2.\sin^2\beta + (L.\cos\beta + H)^2}$$

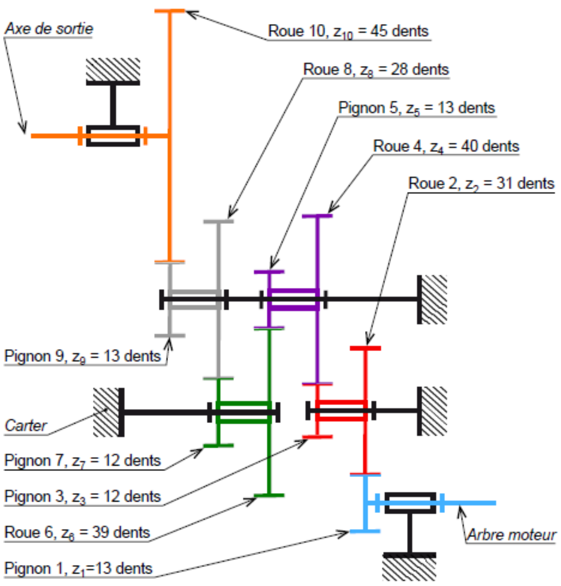
Q.11. Longueur initiale : $\lambda(\beta_i) = \sqrt{0{,}2^2.\sin^2(-150) + (0{,}2.\cos(-150) + 0{,}8)^2} = 0{,}634\,m$

Longueur finale : $\lambda(\beta_f) = \sqrt{0{,}2^2.\sin^2(-40) + (0{,}2.\cos(-40) + 0{,}8)^2} = 0{,}962\,m$

$\boxed{\Delta\lambda = 0{,}962 - 0{,}634 = 0{,}328 \text{ m} < 0{,}4 \text{ m} \rightarrow \text{C.d.C.F. ok.}}$

Servomoteur

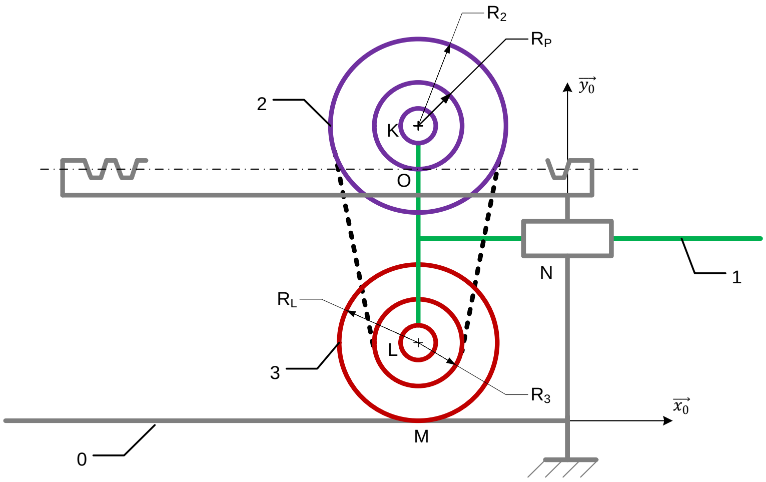
Transmission de puissance



$$\frac{\omega_s}{\omega_e} = (-1)^5\frac{Z_1.Z_3.Z_5.Z_7.Z_9}{Z_2.Z_4.Z_6.Z_8.Z_{10}} = -\frac{13\times 12\times 13\times 12\times 13}{31\times 40\times 39\times 28\times 45} = -\frac{169}{32550} \approx -\frac{1}{193}$$

Tête de découpe

Transmission de puissance



- Bâti 0
- Chariot 1
- Poulie 2
- Couteau 3

$$V = R_P.\omega_{2/1} \Longrightarrow \omega_{2/1} = \frac{V}{R_P}$$

$$\frac{\omega_{3/1}}{\omega_{2/1}} = \frac{R_2}{R_3} \Rightarrow \omega_{3/1} = \frac{R_2}{R_3}.\omega_{2/1}$$

$$\omega_{3/1} = \frac{R_2}{R_3}.\frac{V}{R_P}$$