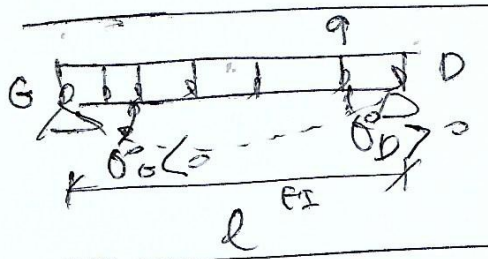
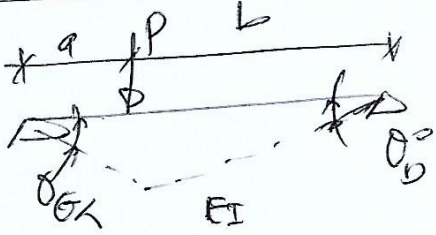
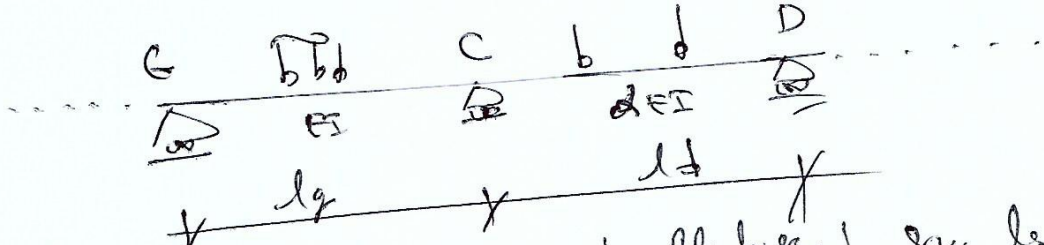
Ex: θ° — Complément de cours

Poutre	θ°_G	θ°_D
	$\frac{-ql^3}{24EI}$	$+\frac{ql^3}{24EI}$
	$\frac{-Pab(l+b)}{6EIl}$	$+\frac{Pab(l+a)}{6EIl}$

théorème de 3 moments



M_G, M_C et M_D les moments fléchissant sur les appuis considérés :

$$l_g M_G + 2(l_g + l'_d) M_C + l'_d M_D = 6EI\left((\theta^\circ_C)_d - (\theta^\circ_C)_g + \ldots\right)$$

avec $l'_d = \frac{l_d}{\alpha}$; $\alpha = \frac{(EI)_d}{(EI)_g}$

Complément de cours

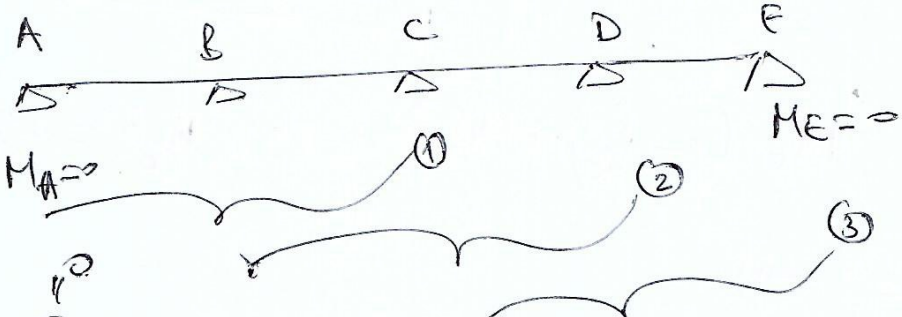
* Cas particuliers souvent rencontrés
  - Les appuis sont considérés fixes $\Rightarrow \varphi = 0$
  - La poutre continue a inertie constante :

$$\alpha = \frac{(EI)_d}{(EI)_g} = 1 \quad : \quad EI : \text{rigidité à la flexion}$$

$$\Rightarrow l_g M_G + 2(l_g + l_d) M_C + l_d M_D = 6EI\left((\theta_C^-)_d - (\theta_C^+)_g\right)$$

* Les travées de rives

a°)



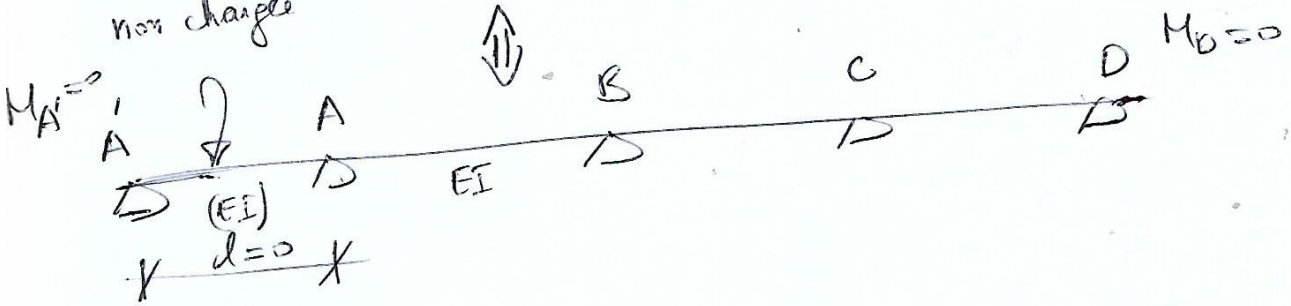
① : M_A M_B M_C → Eq 1

② M_B M_C M_D → Eq 2

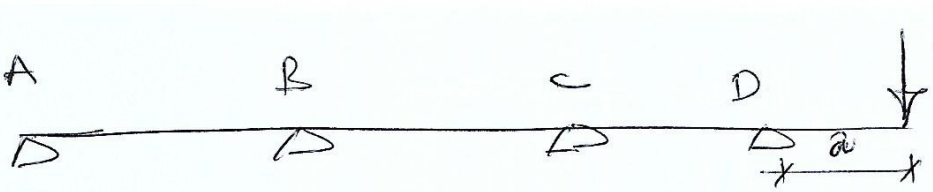
③ M_C M_D $M_E = 0$ → Eq 3

b°)

non chargé ⇕

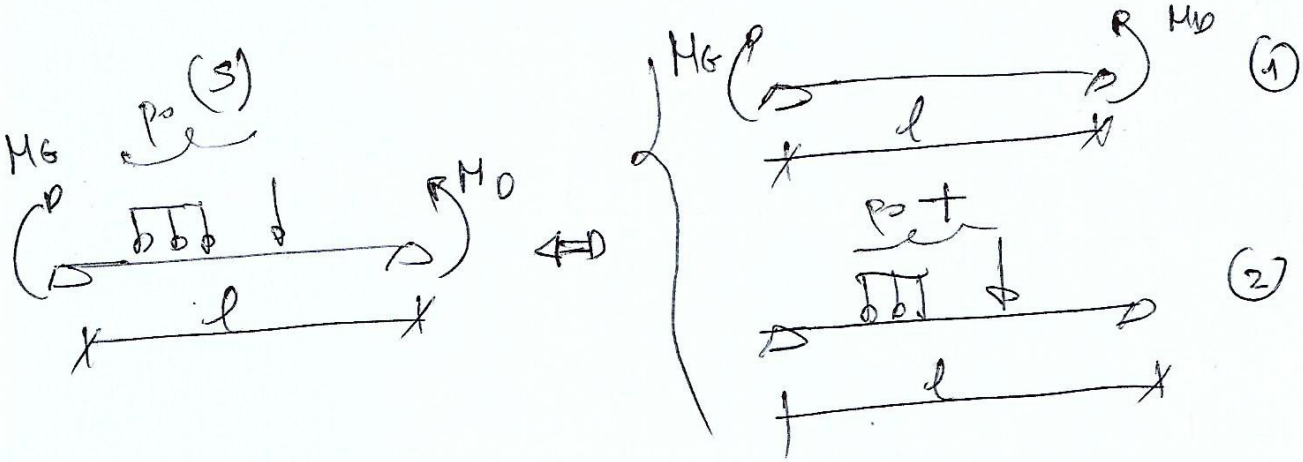


c)



$M_D = -Pa$

* Equilibre d'une travée quelconque d'une poutre continue :



(1) $M_f^{(1)}(x) = M_G \cdot \left(1 - \frac{x}{l}\right) + M_D \cdot \frac{x}{l}$

(S) : $M_f(x) = M_f^1 + M_f^2$

(2) $M_f^{(2)}(x) = m(x)$

$\Rightarrow M_f(x) = m(x) + M_G \cdot \left(1 - \frac{x}{l}\right) + M_D \cdot \frac{x}{l}$

$\Rightarrow T_f(x) = \frac{dM_f}{dx}$

Rq : $m(x)$: est le moment fléchissant de la travée isostatique uniquement aux chargement p.

Exp : $m(x)$: