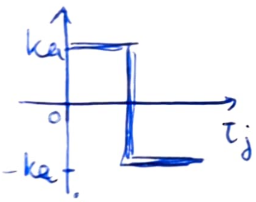
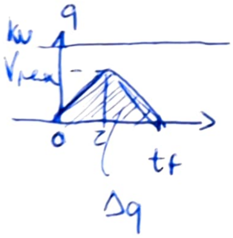
$\tau_i = \frac{k_v}{k_a}$ | $t_f - \tau_j = \frac{k_v}{k_a} = \tau_i$ | $T = \frac{\Delta q_i}{k_v} - \frac{k_v}{k_a}$ | $t_f = \frac{\Delta q_i}{k_v} + \frac{k_v}{k_a}$

$0 \leq t \leq \tau_i$	$\tau_i \leq t \leq \tau_j$	$\tau_j \leq t < t_f$
$\ddot q(t) = k_a$	$\ddot q(t) = 0$	$\ddot q(t) = -k_a$
$\dot q(t) = k_a . t$	$\dot q(t) = k_v$	$\int_t^{t_f} \ddot q(u)\,du = \overbrace{\dot q(t_f)}^{=0} - \dot q(t)$
$q(t) = q_0 + \frac{k_a}{2} t^2$	$q(t)$	$\int_t^{t_f} -k_a\, du = -k_a(t_f - t)$
	$\int_{\tau_i}^{t} \dot q(u)\,du = q(t) - q(\tau_i)$	$\dot q(t) = -k_a(t - t_f)$
	$k_v(t - \tau_i) = q(t) - q(\tau_i)$	$\int_t^{t_f} \dot q(u)\,du = \underbrace{q(t_f)}_{q_f} - q(t)$
	$q(t) = q(\tau_i) + k_v(t - \tau_i)$	$\int_t^{t_f} -k_a(u - t_f)\,du = q_f - q(t)$
		$q(t) = q_f - \frac{k_a}{2}(t - t_f)^2$

Petit exercice





$2\tau = t_f$

Connu : $\boxed{\Delta q = q_f - q_0}$ $\boxed{k_a, k_v}$

On cherche : $\boxed{t_f}$ et $\boxed{V_{max}}$

En sachant que $\tau_i = \tau_j \Rightarrow$ triangle $\quad T = 0 \quad \frac{\Delta q}{k_v} = \frac{k_v}{k_a}$

avec $\Delta q < \frac{k_v^2}{k_a}$

$$\int_0^{t_f} \dot q(t)\, d(t) = \Delta q = \tau . V_{max} = \frac{t_f}{2} V_{max}$$

$$\int_0^{\tau} \ddot q(t)\, d(t) = \dot q(\tau) - \dot q(0) = \boxed{V_{max} = k_a . \tau} \qquad \tau = \frac{\Delta q}{k_a}$$

$$\frac{\Delta q}{\tau} = V_{max} = k_a \tau \Rightarrow \tau^2 = \frac{\Delta q}{k_a} \Rightarrow \tau = \sqrt{\frac{\Delta q}{k_a}} \rightarrow V_{max} = \sqrt{k_a \Delta q}$$

Synchronisation des axes

Il faut satisfaire l'éq : $\boxed{\frac{\lambda_1 k_{v_1}}{\gamma_1 k_{a_1}} + \frac{\Delta_1}{\lambda_1 k_{v_1}} = \frac{\lambda_2 k_{v_2}}{\gamma_2 k_{a_2}} + \frac{\Delta_2}{\lambda_2 k_{v_2}}}$ $\left.\begin{matrix}\lambda_1 ?\\ \lambda_2 ?\\ \gamma_1 ?\\ \gamma_2 ?\end{matrix}\right\} \rightarrow$ pour [illegible]

temps d'accélération

Même temps d'acc $\Rightarrow \frac{\lambda_1 k_{v_1}}{\gamma_1 k_{a_1}} = \frac{\lambda_2 k_{v_2}}{\gamma_2 k_{a_2}}$ | $t_{f_1} = t_{f_2} \Rightarrow \frac{\Delta_1}{\lambda_1 k_{v_1}} = \frac{\Delta_2}{\lambda_2 k_{v_2}}$

$$\lambda_2 = \frac{\Delta_2}{\Delta_1}\frac{kv_1}{kv_2}\lambda_1$$

$0 \leq \lambda_2 \leq 1$

$0 \leq \lambda_1 \leq 1$

pourcentages

$$\boxed{\frac{\Delta_2}{\Delta_1}\frac{kv_1}{kv_2}\cdot\lambda_1 \leq 1}$$

$$\Rightarrow \boxed{\lambda_1 \leq \frac{\Delta_1}{\Delta_2}\frac{kv_2}{kv_1}}$$

$$\boxed{\lambda_1 = \min\left(1, \frac{\Delta_1}{\Delta_2}\cdot\frac{kv_2}{kv_1}\right)}$$

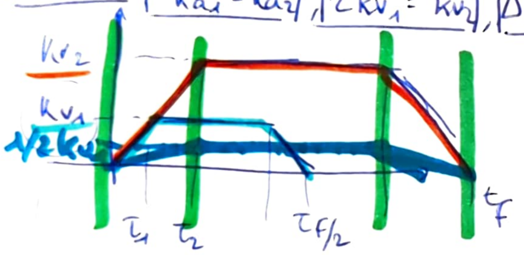
λ_1 c'est le min des 2

même raisonnement pour λ_2, γ_1, γ_2

Petit exercice

On donne : $\boxed{ka_1 = ka_2}$, $\boxed{2kv_1 = kv_2}$, $\boxed{\Delta_2 = 4\Delta_1}$

Transformation de kv_1 pour syncronisation des axes scté



$\lambda_1 = \min(1, 1/2) = 1/2 \rightarrow 50\%$

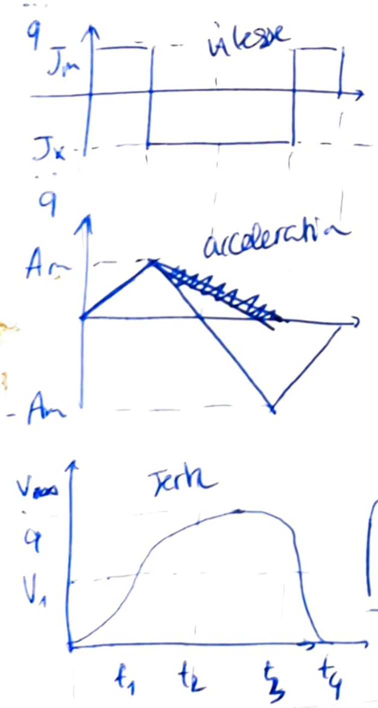
$\gamma_1 = \min(1, 1/4) = 1/4 \rightarrow 25\%$

$\lambda_2 = \min(1, 4 \cdot 1/2) = 1 \rightarrow 100\%$

$\gamma_2 = \min(1, 4) = 1 \rightarrow 100\%$

$1/4\ kv_1$

Exercice type Examen



On connaît J_m, V_m, $V_1 = \frac{V_m}{2}$ et $q(0)$ et $q(t_4)$

On demande de calculer t_1 et A_m

$$\int_0^{t_1} \dddot{q}(t)\,dt = \ddot{q}(t_1) - \ddot{q}(0) = A_m - 0 \quad \boxed{J_m t_1 = A_m}$$

$$\int_0^{t_1} \ddot{q}(t)\,dt = \dot{q}(t_1) - \dot{q}(0) = V_1 \Leftrightarrow \boxed{1/2\, A_m t_1 = V_1}$$

$$t_1 = \frac{A_m}{J_m} = \frac{2V_1}{A_m} \Rightarrow A_m^2 = 2V_1 J_m \Rightarrow \boxed{A_m = \sqrt{2V_1 J_m}}$$

$$\boxed{t_1 = \sqrt{\frac{2V_1}{J_m}}}$$

Ce qui sera demandé à l'exam

① MGD ④ MDI ⑦ Dyn → Repère et DHM

② ~~MGI~~ ⑧ Redondance → 50% de l'exam

③ MDD ⑥ GT Génération traj