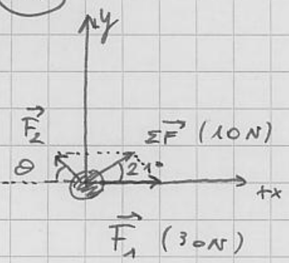
(4.12)



- $\|\Sigma \vec F\| = m a = 10N$
- $\vec F_2$ est sans doute comme dessiné, car $\|\Sigma\vec F\| < \|\vec F_1\|$
- on cherche $F_2 > 0$, $\theta > 0$

<u>2ème loi de Newton:</u>

$$\begin{cases} \Sigma F_x : & F_1 - F_2\cos\theta = \Sigma F\cos 21 \\ & 30 - F_2\cos\theta = 10\cos 21 \quad (1) \\ \Sigma F_y : & F_2\sin\theta = \Sigma F\sin 21 \\ & F_2\sin\theta = 10\sin 21 \quad (2) \end{cases}$$

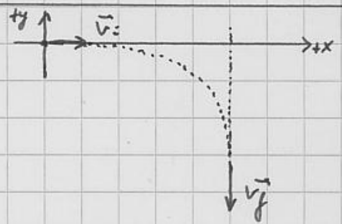
(1) : $F_2\cos\theta = 30 - 10\cos 21$

(2) : $F_2\sin\theta = 10\sin 21$

$\Rightarrow \frac{(2)}{(1)} = \frac{F_2\sin\theta}{F_2\cos\theta} = \operatorname{tg}\theta = \frac{10\sin 21}{30-10\cos 21} \Rightarrow \boxed{\theta \cong 9{,}84° \text{ vers } +y \text{ par rapport à } -x}$

$\Rightarrow F_2 = \frac{10\sin 21}{\sin\theta} \cong \underline{\underline{20{,}97\,N}}$

(4.13)



$v_{ix} = 2170\ m/s$

$v_{fy} = 4340\ m/s$

$$\begin{cases} a_x = \frac{v_{fx} - v_{ix}}{t_x} = \frac{-2170}{t_x} = -\frac{68'300}{4160} \\ a_y = \frac{v_{fy}-v_{iy}}{t_y} = \frac{-4340}{t_y} = -\frac{68'300}{4160} \end{cases} \Rightarrow \begin{matrix} t_x = \frac{2170\cdot 4160}{68'300} \cong \underline{\underline{132{,}17\,s}}, \text{ moteur } -x \\ t_y = \frac{4340\cdot 4160}{68'300} \cong \underline{\underline{264{,}33\,s}}, \text{ moteur } -y \end{matrix}$$

(4.28)

$M_J \cong 318\, M_T$

$a_J \cong 2{,}53\, a_T$

<u>Masses :</u>

$M_J = \frac{4}{3}\pi\rho_J\cdot R_J^3$; $M_T = \frac{4}{3}\pi\rho_T\cdot R_T^3$ Pas très utile, car ρ_T et ρ_J inconnues

<u>accélérations gravité :</u> $a_J = G\cdot\frac{M_J}{R_J^2}$; $a_T = G\cdot\frac{M_T}{R_T^2}$

$$\frac{a_J}{a_T} = 2{,}53 = \frac{\cancel{G}\cdot\frac{M_J}{R_J^2}}{\cancel{G}\cdot\frac{M_T}{R_T^2}} = \frac{M_J}{R_J^2}\cdot\frac{R_T^2}{M_T} = \frac{M_J}{M_T}\cdot\left(\frac{R_T}{R_J}\right)^2 = 318\cdot\left(\frac{R_T}{R_J}\right)^2$$

$$\Rightarrow \left(\frac{R_T}{R_J}\right)^2 = \frac{2{,}53}{318} \Rightarrow \frac{R_T}{R_J} = \sqrt{\frac{2{,}53}{318}} \Rightarrow \underline{\underline{R_J}} = R_T\cdot\sqrt{\frac{318}{2{,}53}} \cong \underline{\underline{11{,}21\,R_T}}$$