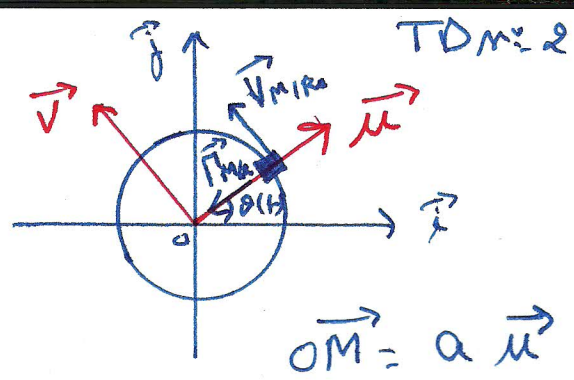


EX01: Mouvement de rotation.

1° $\vec{v}(M/R_0)$ et $\vec{\Gamma}(M/R_0) = f(\dot{\theta}(t))$?

$$\vec{v}(M/R_0) = \frac{d}{dt} (\vec{OM})_{/R_0}$$

$$\left(\frac{d \vec{OM}}{dt} \right)_{R_0} = \frac{d \vec{OM}}{dt} /_R + \vec{\Omega}_{R/R_0} \wedge \vec{OM}$$



$$R(0, \vec{u}, \vec{v}, \vec{k})$$

$$R_0(0, \vec{i}, \vec{j}, \vec{k})$$

$$\vec{v}_{M/R_0} = \dot{\theta} \vec{k} \wedge a \vec{u} = a \dot{\theta} \vec{v}$$

$$\vec{\Gamma}_{M/R_0} = \left[\frac{d}{dt} \vec{v}_{M/R_0} \right] = \frac{d}{dt} (a \dot{\theta} \vec{v})$$

$$= a \ddot{\theta} \vec{v} + \dot{\theta} \dot{\theta} \vec{v} + a \dot{\theta} \frac{d \vec{v}}{dt} /_R$$

$$= a \ddot{\theta} \vec{v} + a \dot{\theta} \left[\frac{d \vec{v}}{dt} \right]_R + \dot{\theta} \vec{k} \wedge \vec{v}$$

$$= a \ddot{\theta} \vec{v} + a \dot{\theta}^2 (-\vec{u}) \Rightarrow a \ddot{\theta} \vec{v} - a \dot{\theta}^2 \vec{u} = \vec{\Gamma}_{M/R_0}$$

2° Mvt de rotation uniforme $\Rightarrow \vec{\Gamma}_{M/R_0} = -a \dot{\theta}^2 \vec{u}$

3° $g = 9.81 \text{ m/s}^2$; $\dot{\theta} = \sqrt{\frac{\Gamma_{M/R_0}}{a}} = \sqrt{\frac{9.81}{10}} \approx 1 \text{ rad/s}$

$2a = 20 \text{ m}$

