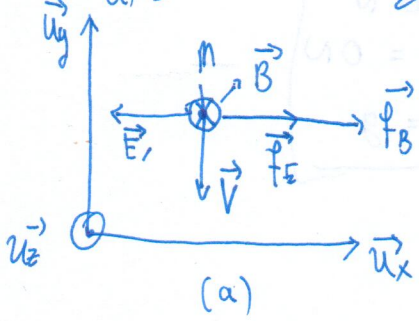
Corrigé CC1 - Chim Méca Point 2 : 14/03/2024

Q1 : $\vec{E} = -E\vec{u_x}$, $\vec{B} = -B\vec{u_z}$, $\vec{V} = -V\vec{u_y}$, $E, B, v > 0$, $\begin{cases} \vec{f_B} = q(\vec{V} \wedge \vec{B}) \\ \vec{f_E} = q\vec{E} \end{cases}$, $q <$

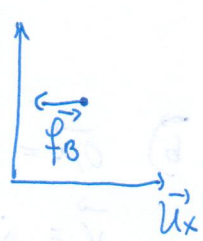
a)



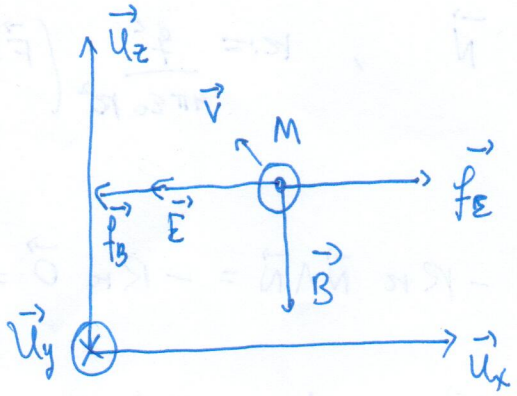
(a)

Réponse! erreur : $\vec{f_B}$ pointe vers $(-\vec{u_x})$

Correction

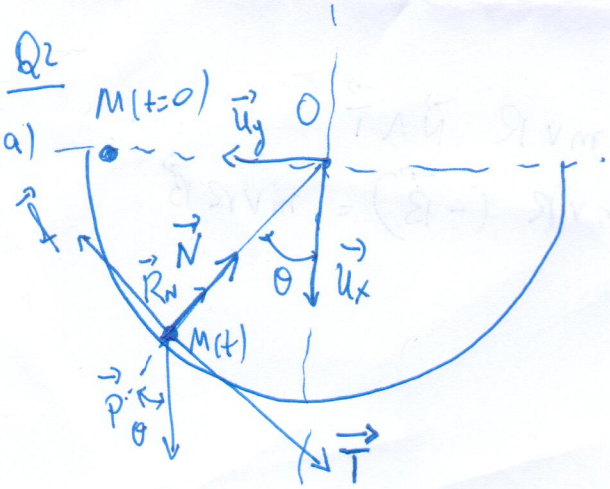


b)



Q2

a)



b) $\vec{P} = mg\left(-\cos\theta\,\vec{N} + \sin\theta\,\vec{T}\right)$

$\vec{f} = -f\vec{T}$

$\vec{R_N} = R_N\vec{N}$

c) $m\vec{a} = \sum \vec{F} \Rightarrow \begin{cases} m\ddot{s} = mg\sin\theta - f & (1) \\ m\dfrac{\dot{s}^2}{R} = -mg\cos\theta + R_N & (2) \end{cases}$

$\vec{a} = \ddot{s}\vec{T} + \dfrac{\dot{s}^2}{R}\vec{N}$

d) $\theta(0) = \dfrac{\pi}{2}$ rad et $\dot{s}(0) = R\dot{\theta}(0) = 0$ m/s

e) $f = \alpha R_N$, (1) et (2) pour $t=0$ deviennent $\Rightarrow \begin{cases} m\ddot{s}(0) = mg\sin\dfrac{\pi}{2} - f(0) & (1^*) \\ m\cdot\dfrac{0^2}{R} = -mg\cos\dfrac{\pi}{2} + R_N(0) & (2^*) \end{cases}$

$\Rightarrow$ de $(2^*) \Rightarrow 0 = 0 + R_N(0) \Rightarrow R_N(0) = 0$ Newtons.

$\rightarrow f(0) = \alpha R_N(0) = \alpha \cdot 0 = 0$ Newtons.