

Correction contrôle 7

Exercice 1:

1. **2 points** Système : caillou
Référentiel terrestre (galiléen)

BF: poids \vec{P}

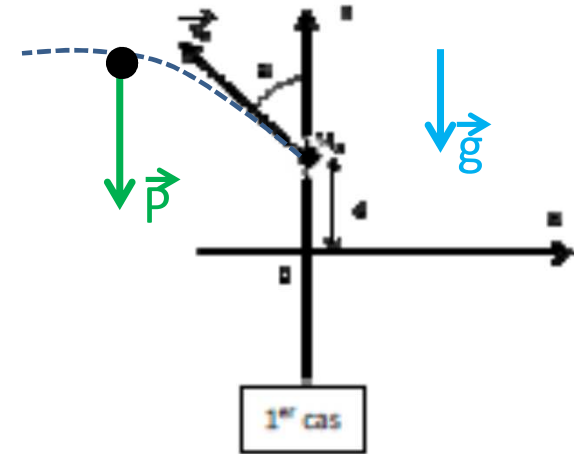
$$m \cdot \vec{a} = \sum \vec{F}_{\text{ext}}$$

$$m \cdot \vec{a} = \vec{P}$$

$$m \cdot \vec{a} = m \cdot \vec{g}$$

$$\vec{a} = \vec{g}$$

2. **2,5 points** projection dans le repère O,x,y: $\vec{a} \begin{cases} a_x = 0 \\ a_y = -g \end{cases}$



1^{er} cas:

$$\vec{a} = \dot{\vec{v}} \quad \vec{v} \begin{cases} v_x = v_{x0} = -v_0 \cdot \sin \alpha \\ v_y = -g \cdot t + v_{y0} = -g \cdot t + v_0 \cdot \cos \alpha \end{cases}$$

$$\vec{v} = \dot{\vec{OM}} \quad \vec{OM} \begin{cases} x = -v_0 \cdot \sin \alpha \cdot t + x_0 = 0 \\ y = -\frac{1}{2} \cdot g \cdot t^2 + v_0 \cdot \cos \alpha \cdot t + y_0 = \alpha \end{cases}$$

2^{ème} cas:

$$\vec{a} = \dot{\vec{v}} \quad \vec{v} \begin{cases} v_x = v_{x0} = -v_0 \cdot \cos \alpha \\ v_y = -g \cdot t + v_{y0} = -g \cdot t - v_0 \cdot \sin \alpha \end{cases}$$

$$\vec{v} = \dot{\vec{OM}} \quad \vec{OM} \begin{cases} x = -v_0 \cdot \cos \alpha \cdot t + x_0 = \alpha \\ y = -\frac{1}{2} \cdot g \cdot t^2 - v_0 \cdot \sin \alpha \cdot t + y_0 = 0 \end{cases}$$