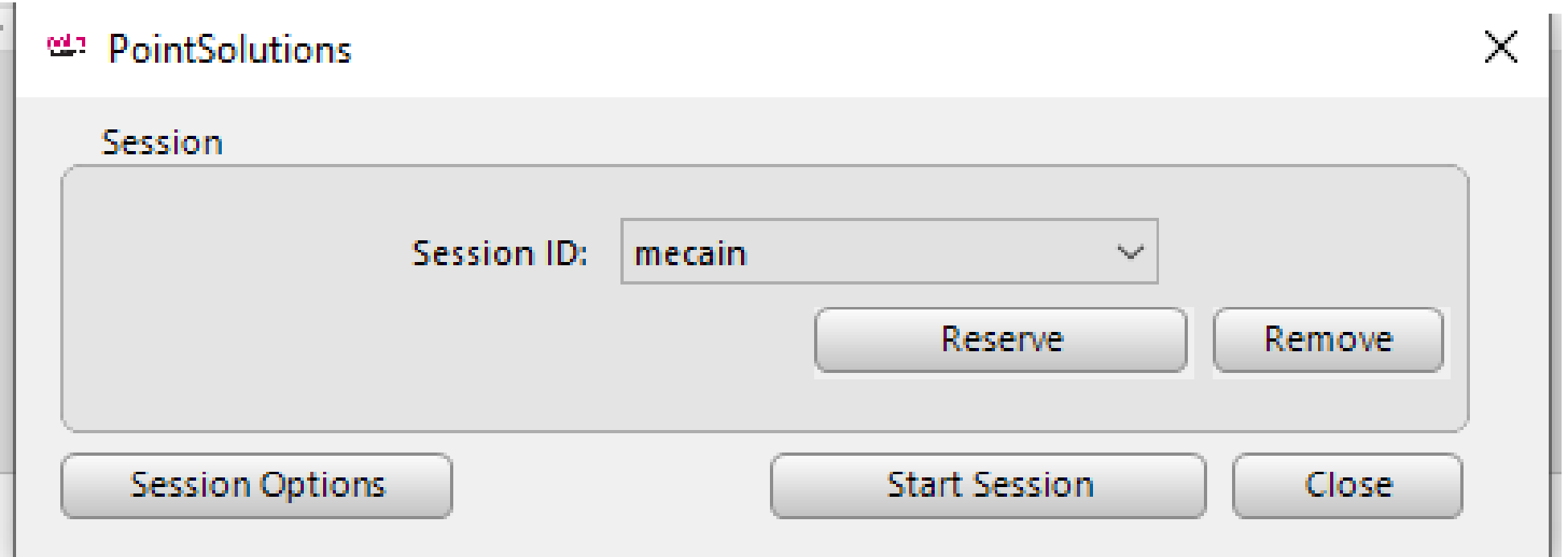
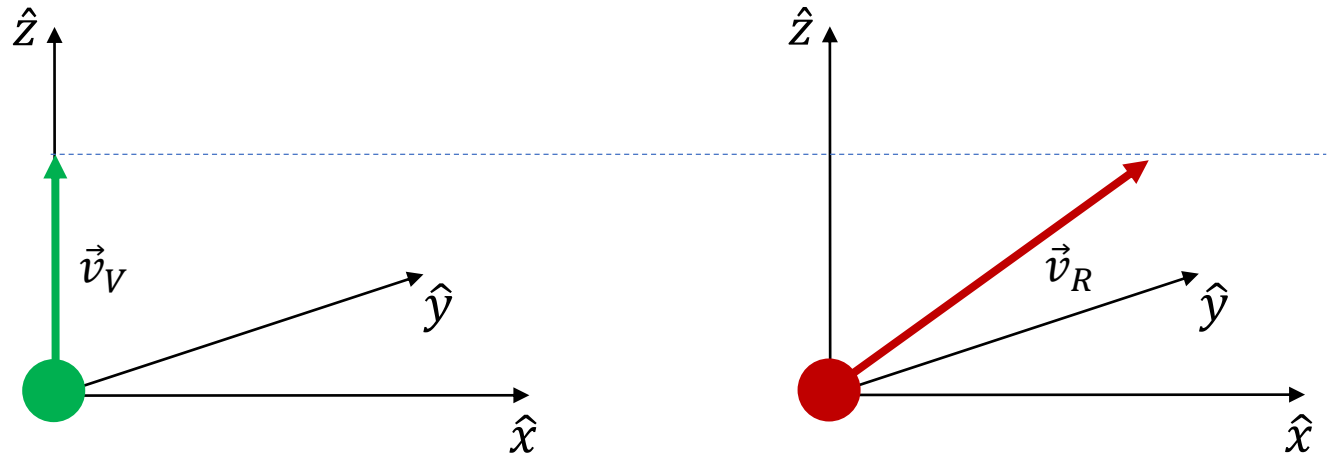
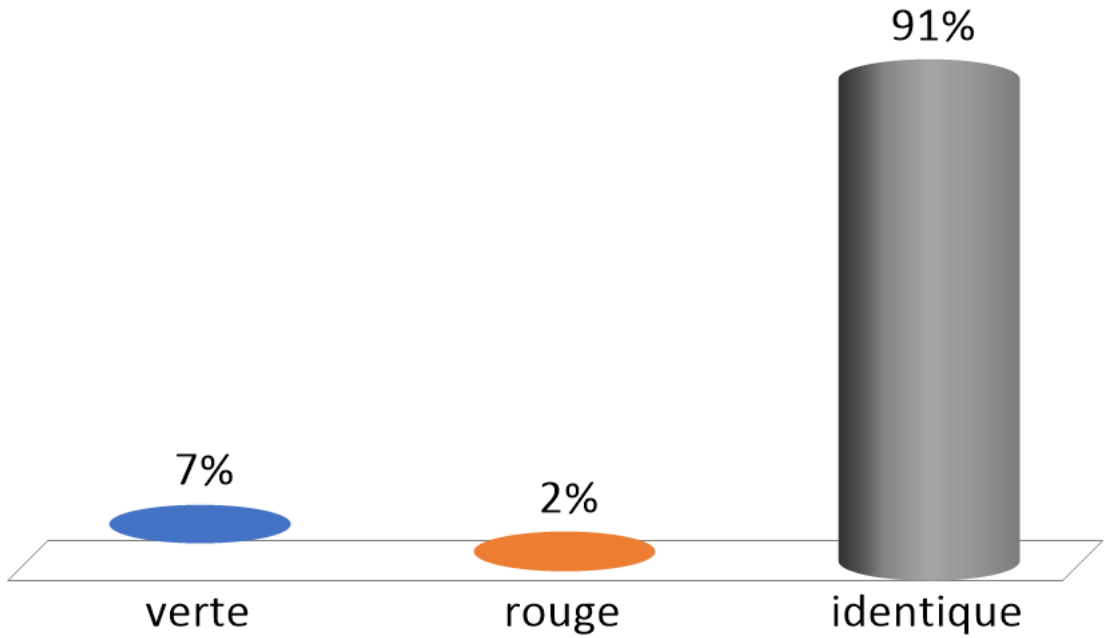
https://participant.turningtechnologies.eu/en/join



Quelle balle monte plus en haut (dans le vide)?

A. verte
B. rouge
✓ C. identique





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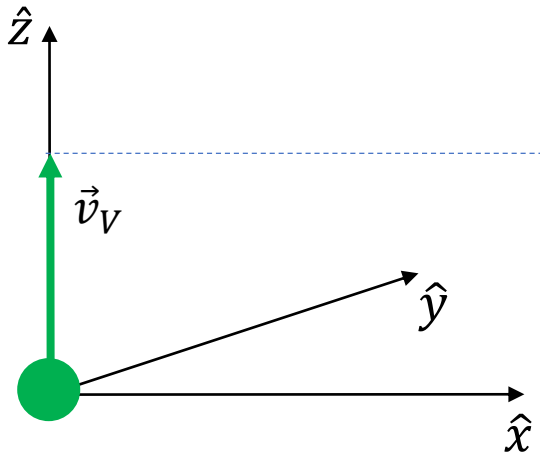
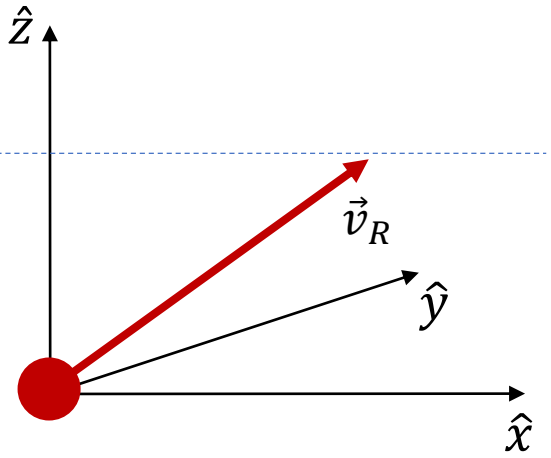
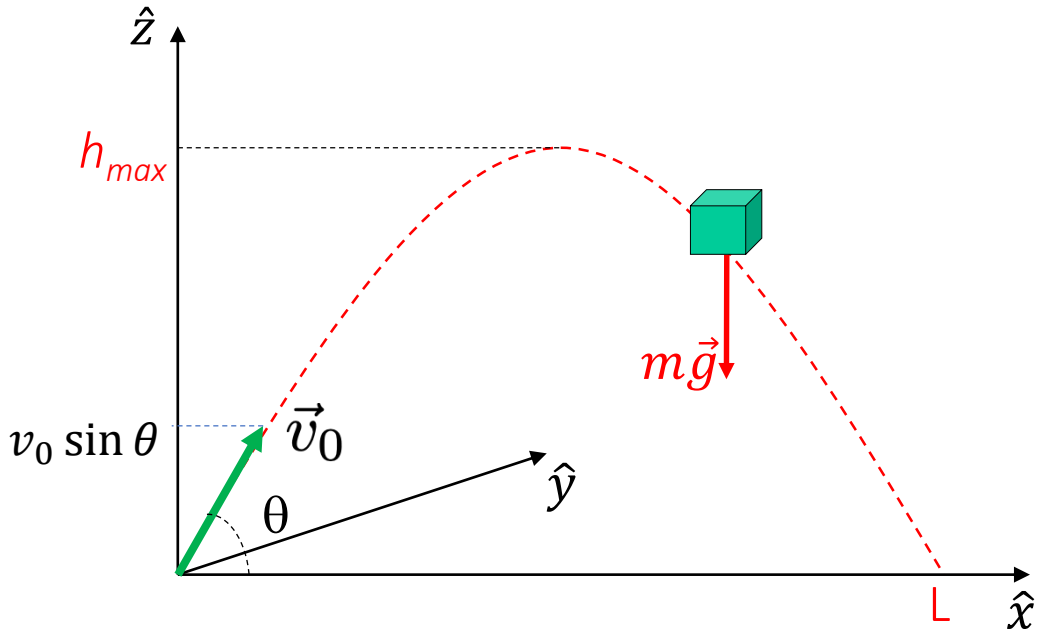




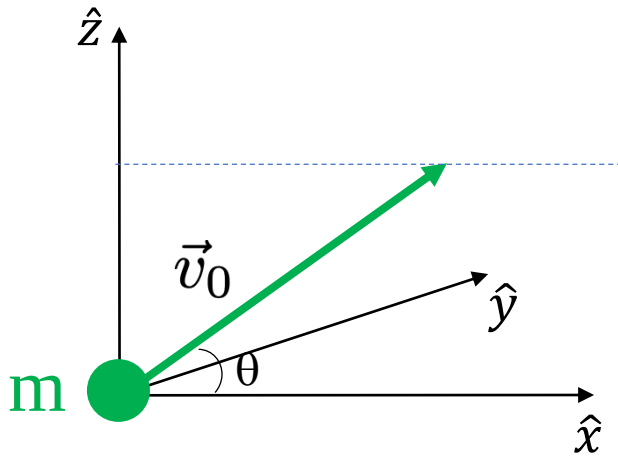
$$h_{max} = \frac{(v_0 \sin\theta)^2}{2g} = \frac{v_{0z}^2}{2g}$$

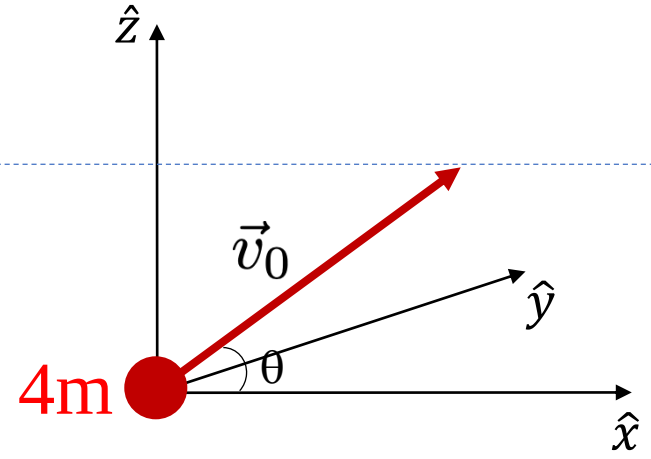


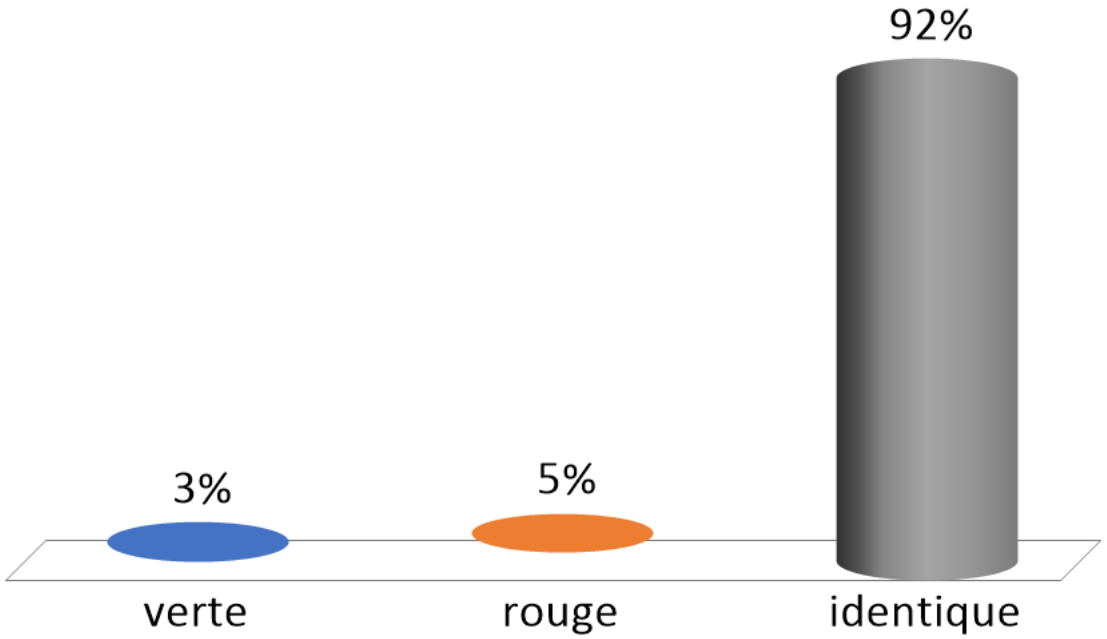
La balle verte et la balle rouge ont la même vitesse le long de $\hat{z}$

Quelle balle tombe plus loin (dans le vide)?

A. verte
B. rouge
✓ C. identique







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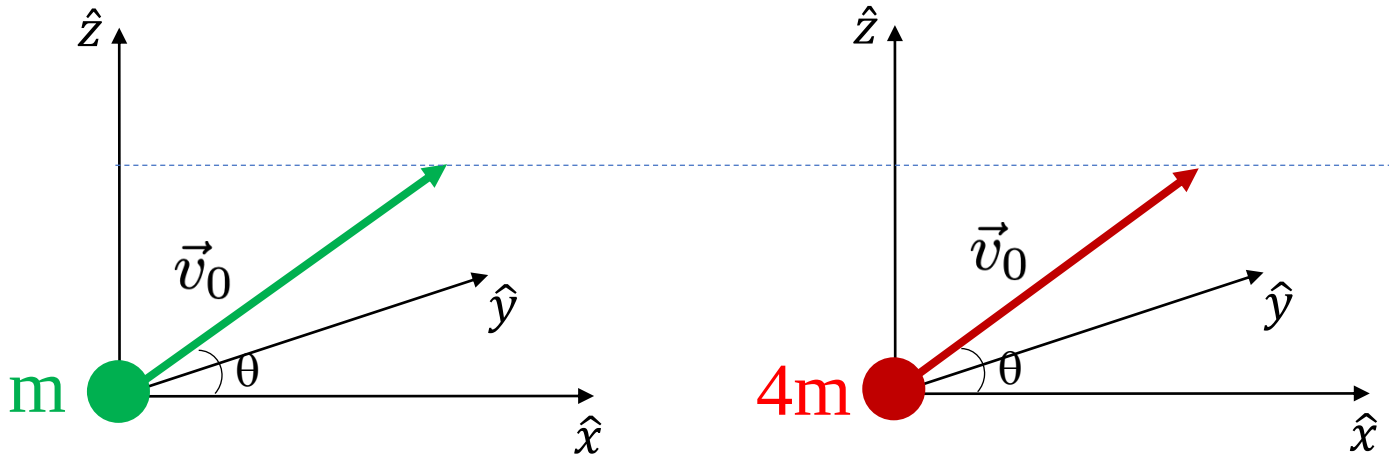
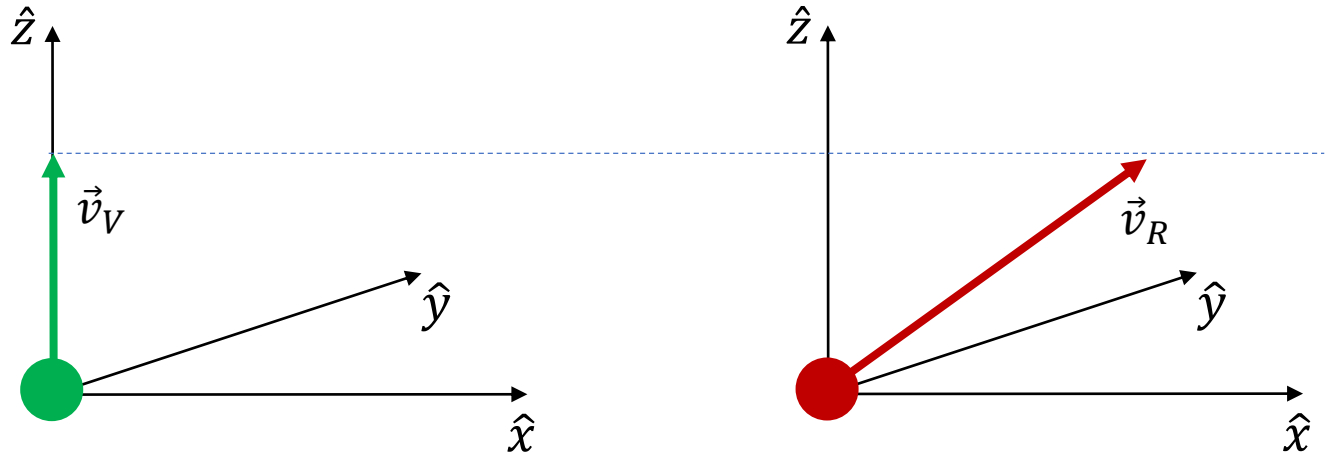


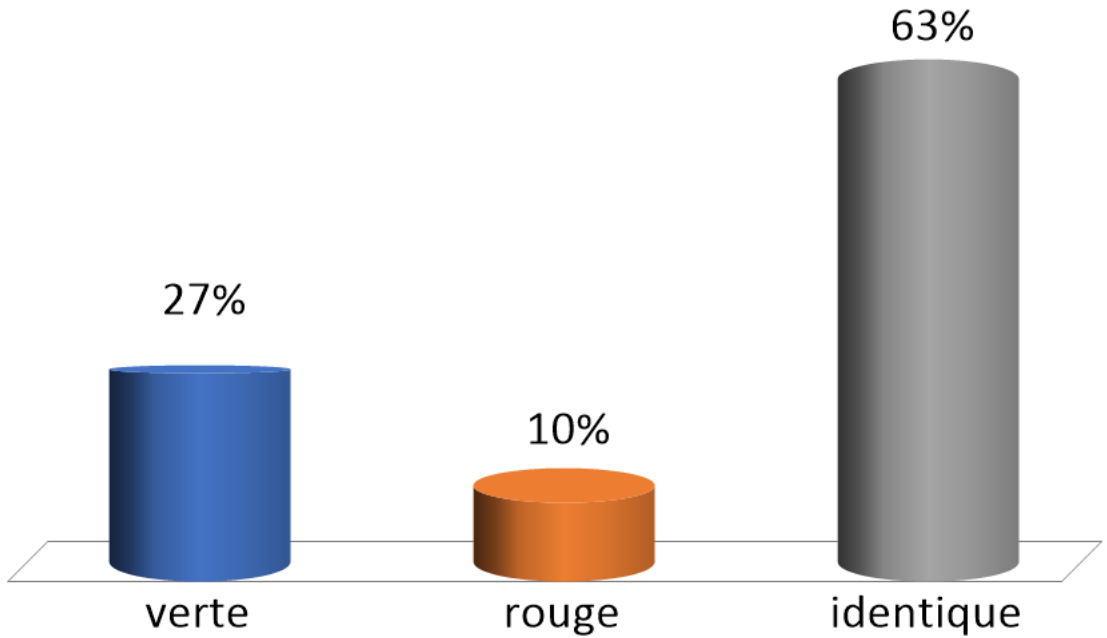
$$L = \frac{2}{g} {v_0}^2 \cos\theta \sin\theta$$

La portée ne dépende pas de la masse

Quelle balle monte plus en haut (dans l'air)?

A. verte
B. rouge
✓ C. identique





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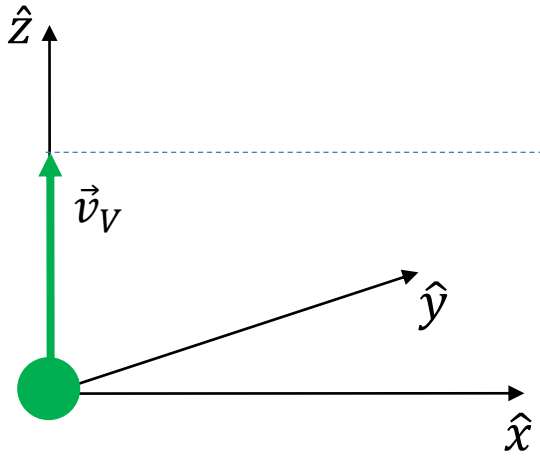
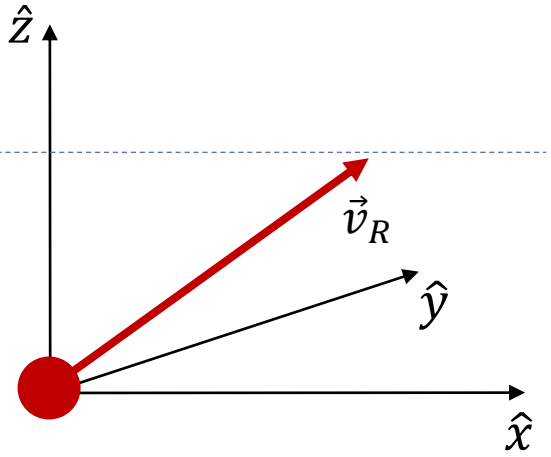




L'hauteur maximale est atteinte à l'instant t_m qui vérifie la condition:

$$\dot{z}(t_m) = -g\tau + (v_{0z} + g\tau)e^{-t_m/\tau} = 0 \quad \Rightarrow \quad e^{-t_m/\tau} = \frac{g\tau}{v_{0z}+g\tau} \quad \Rightarrow \quad t_m = -\tau \ln\left(\frac{g\tau}{v_{0z}+g\tau}\right)$$

$$h_{max} = v_{0z}t_m = -\tau v_{0z} \ln\left(\frac{g\tau}{v_{0z} + g\tau}\right)$$

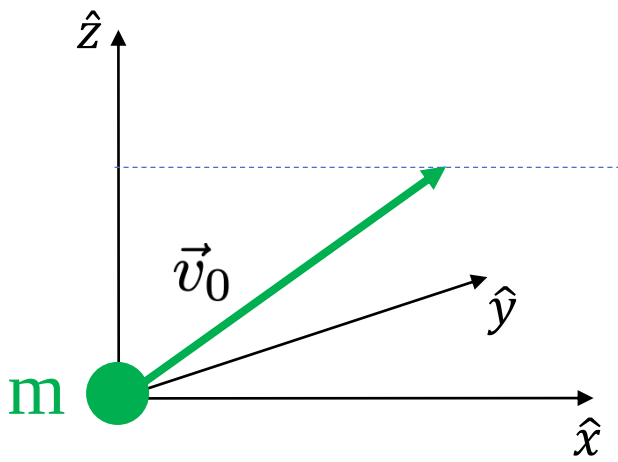
Identique pour les deux balles
vu que elles ont la même v_{0z}

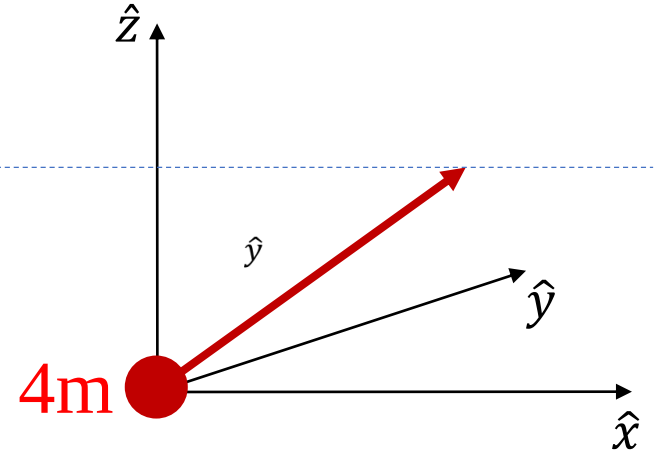
Quelle balle tombe plus loin (dans l'air)?

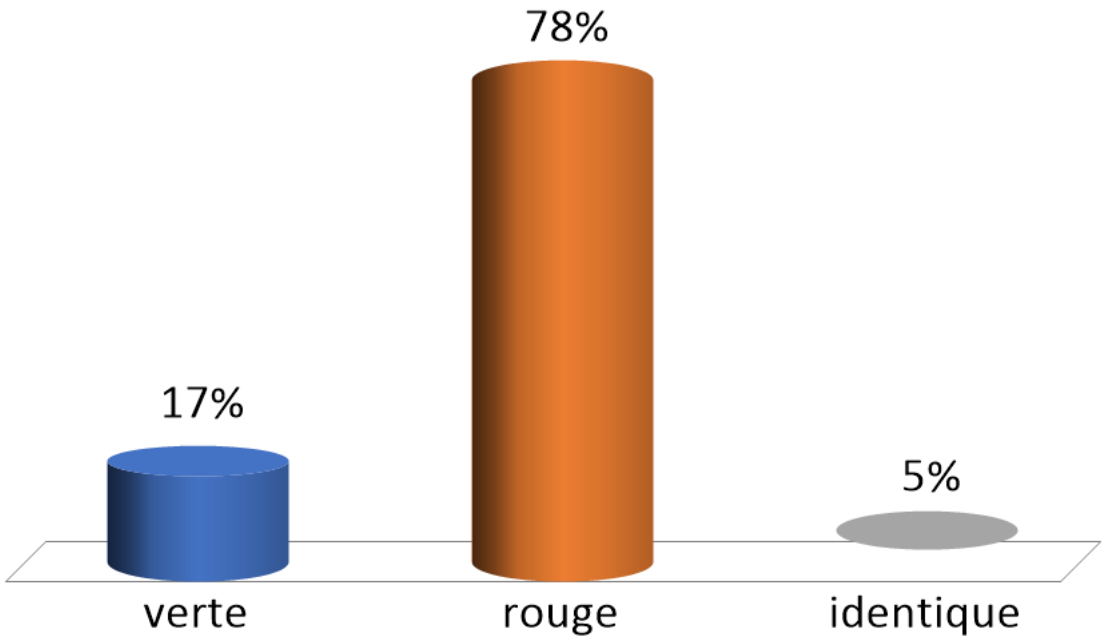
A. verte

✓ B. rouge

C. identique







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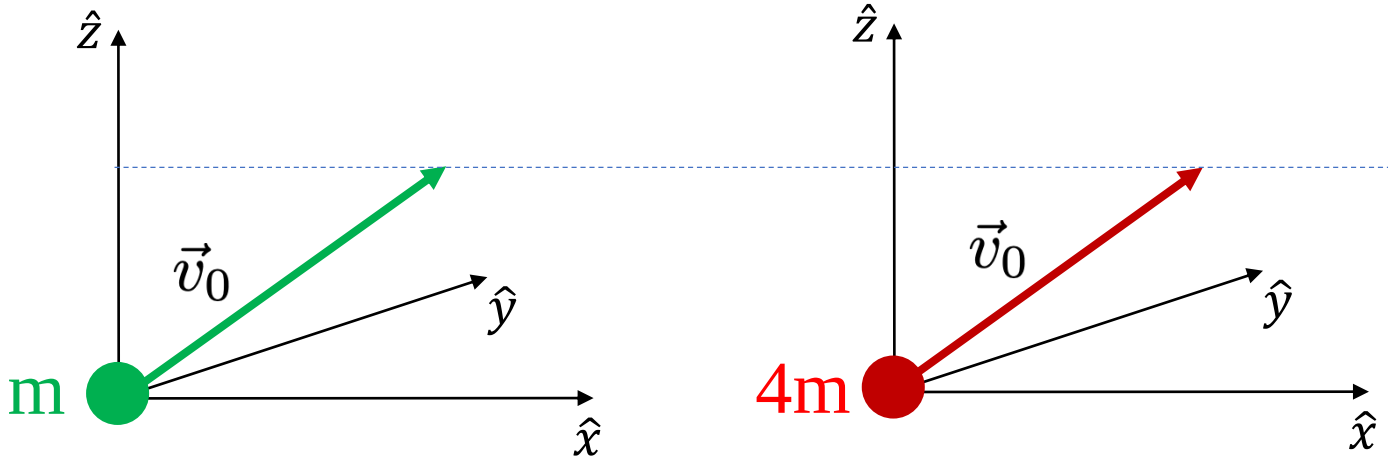

$$L = v_{0x}\tau = v_{0x}\frac{m}{b}$$

Plus la masse est grande, plus longue est la portée