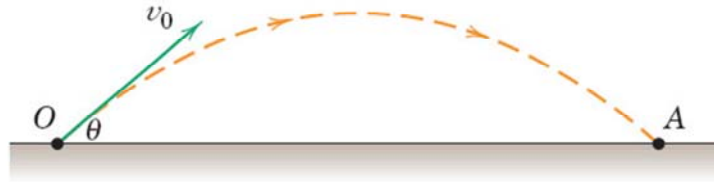


## Angular Impulse and Momentum: Exercise 2



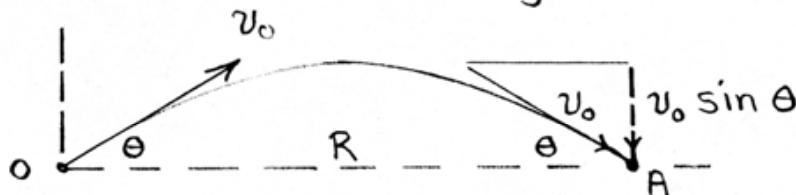
The projectile of **mass  $m$**  is launched with **speed  $v_0$**  at the **angle  $\theta$** .

Determine the magnitude  **$H_O$**  of the **angular momentum** about the launch **point  $O$**  at (a) the instant of **launch** and (b) the instant of **impact**.

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3/243 (a)  $H_O = 0$  when projectile is at O.

(b) Range  $R = \frac{2v_0^2 \cos \theta \sin \theta}{g}$



$$\begin{aligned}
 H_O &= m v_y R = m v_0 \sin \theta \frac{2v_0^2 \cos \theta \sin \theta}{g} \\
 &= \frac{2m v_0^3 \sin^2 \theta \cos \theta}{g}
 \end{aligned}$$

The moment of the projectile weight about point O is always increasing the angular momentum about O.