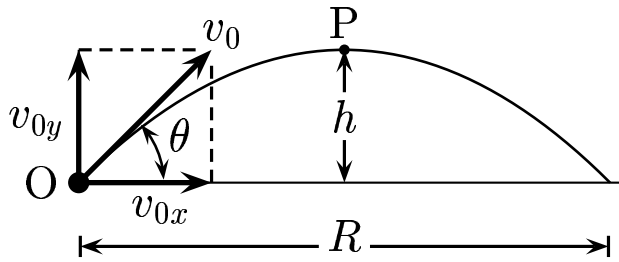


A projectile trajectory has a maximum height h , a range R . The mass is m and the initial speed v_0 . The angle between the initial velocity vector and the horizontal direction is θ .



Determine the angular momentum ℓ at P with respect to O.

- A) $\ell = \frac{R m v_{0x}}{2} = \frac{R m v_0 \cos \theta}{2}$.
- B) $\ell = R m v_{0y} = R m v_0 \sin \theta$.
- C) $\ell = h m v_{0x} = h m v_0 \cos \theta$.

By inspection, at P the momentum vector is $m v_{0x}$.

It is along the horizontal direction.

The lever arm is the perpendicular distance from O to the momentum vector, which is h .

So the angular momentum is $\ell = h m v_{0x}$.

Answer **C**.