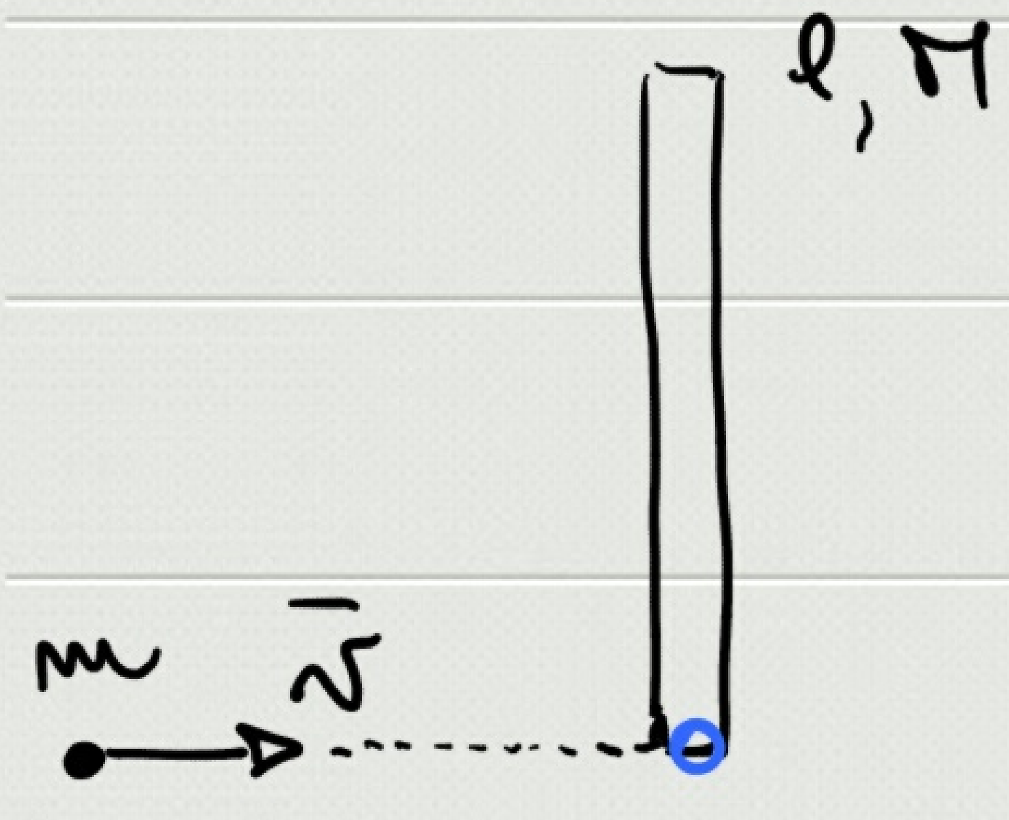


$v_0 = \omega_0 = 0$

urto compl. anelastico

$\bar v', \omega'$

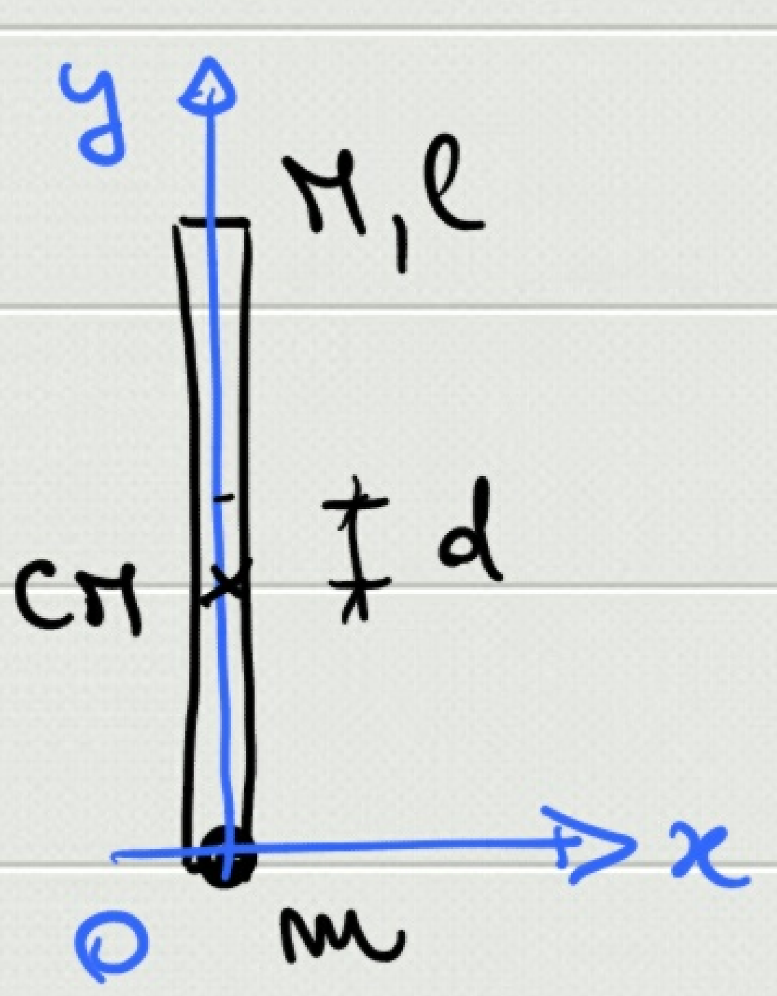
$\boxed{\bar P = cost}$ $\boxed{\bar L^{E}_{polo} = cost}$ $\bar P = M_T \bar v_{CM}$

$\bar P^- = \bar P^+$

$\bar P^- = m \bar v$

$\bar P^+ = (m+M) \bar v'_{CM}$

$$\Rightarrow \boxed{\bar v'_{CM} = \frac{m}{m+M} \bar v}$$



$$y_{CM} = \frac{\cancel{0}\, m + \frac{l}{2} M}{m+M} = \frac{M}{m+M} \frac{l}{2}$$

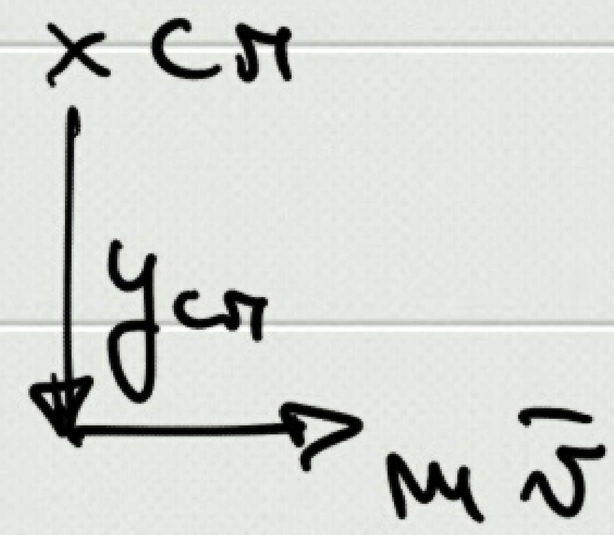
$$d = \frac{l}{2} - y_{CM} = \frac{m}{m+M} \frac{l}{2}$$

$$\bar L^-_{CM} = \bar L^+_{CM}$$

$$\bar{L} = \bar{r} \times m\bar{v} \qquad \bar{L} = I\bar{\omega}$$

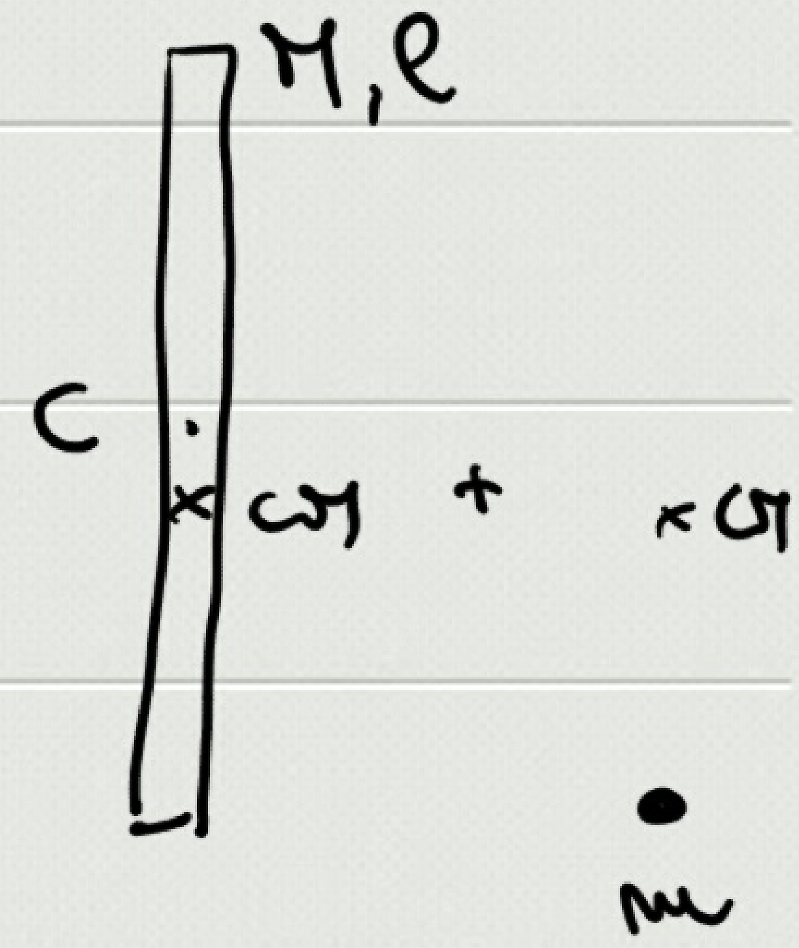
$$\bar{L}^{-}_{CM} = \bar{y}_{CM} \times m\bar{v}$$

$$L^{-}_{CM} = \frac{M}{m+M}\,\frac{l}{2}\,mv$$

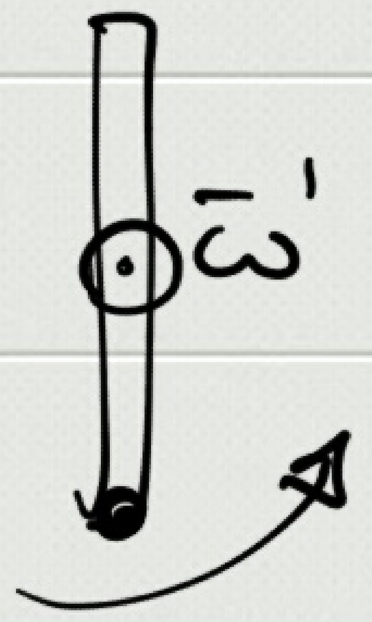


$$\bar{L}^{+}_{CM} = I_{CM}\,\bar{\omega}'$$

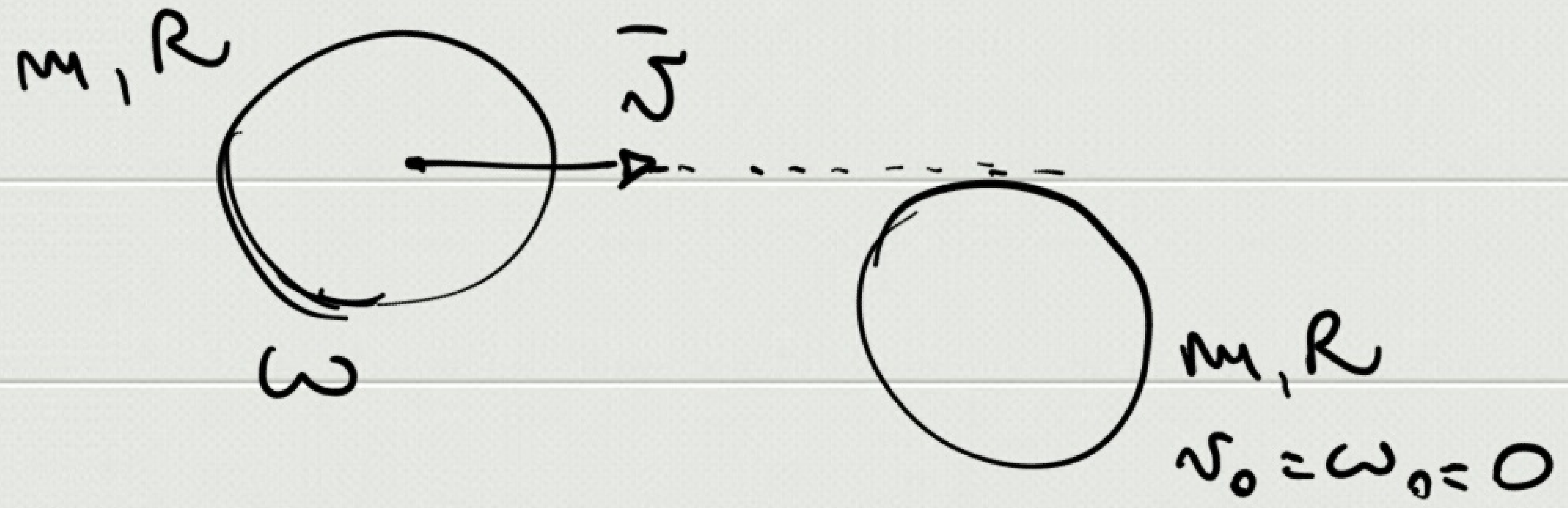
$$I_{CM} = \left(\frac{1}{12}Ml^2 + Md^2\right) + m\,y_{CM}^2$$

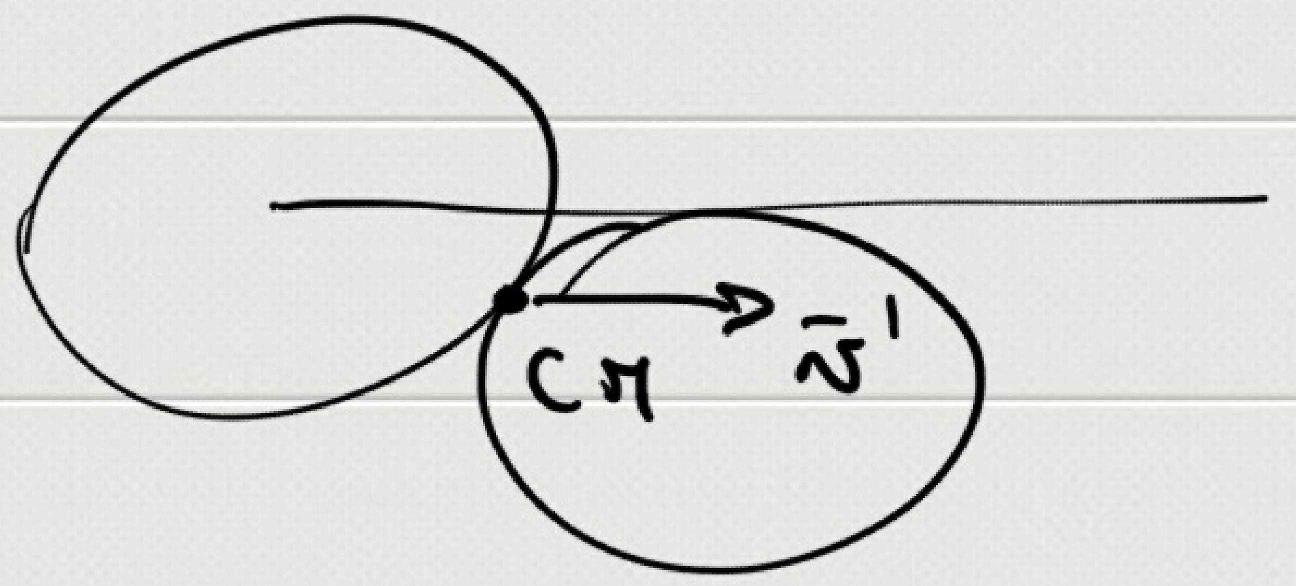


$$L^{-}_{CM} = L^{+}_{CM}$$



$$\Rightarrow \boxed{\omega' = \frac{6mv}{(4m+M)\,l}}$$





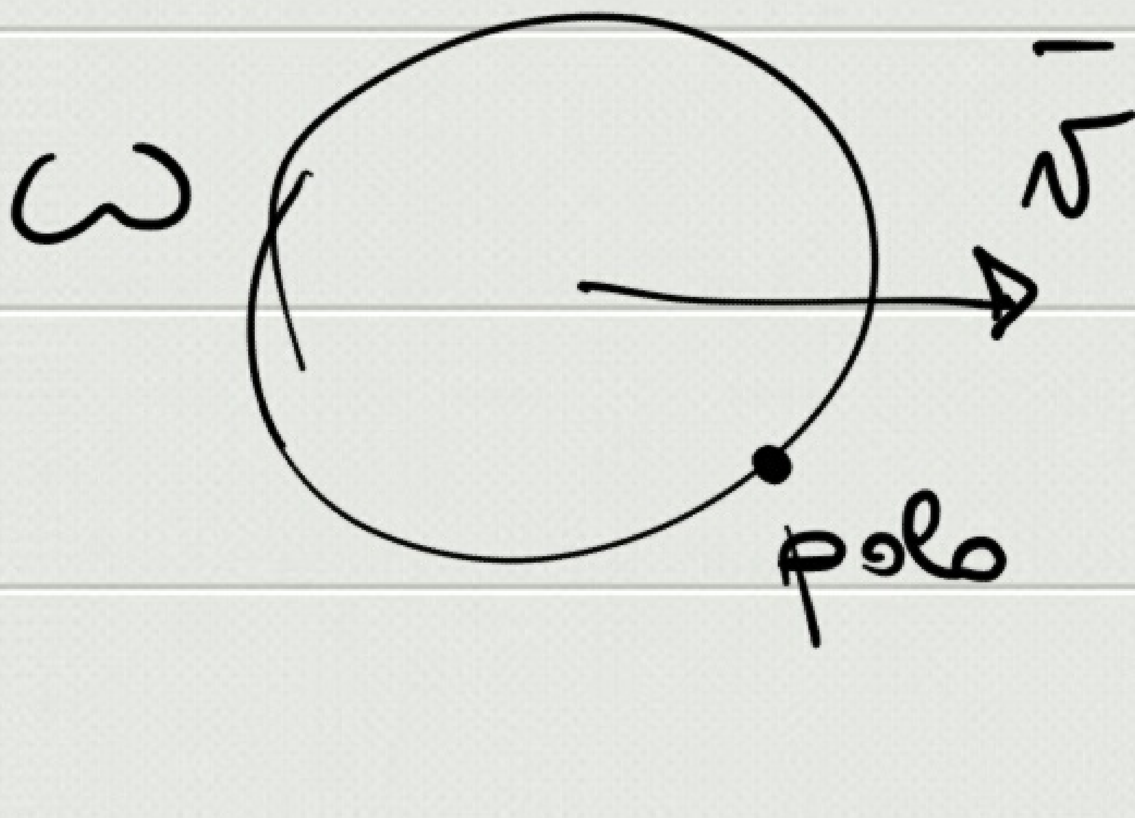
$$\boxed{\bar{v}' \qquad \bar{\omega}' = 0}$$

$$\bar{P} = \text{cost} \qquad \Rightarrow \qquad m\bar{v} = 2m\bar{v}'$$

$$\Rightarrow \boxed{\bar{v}' = \frac{\bar{v}}{2}}$$

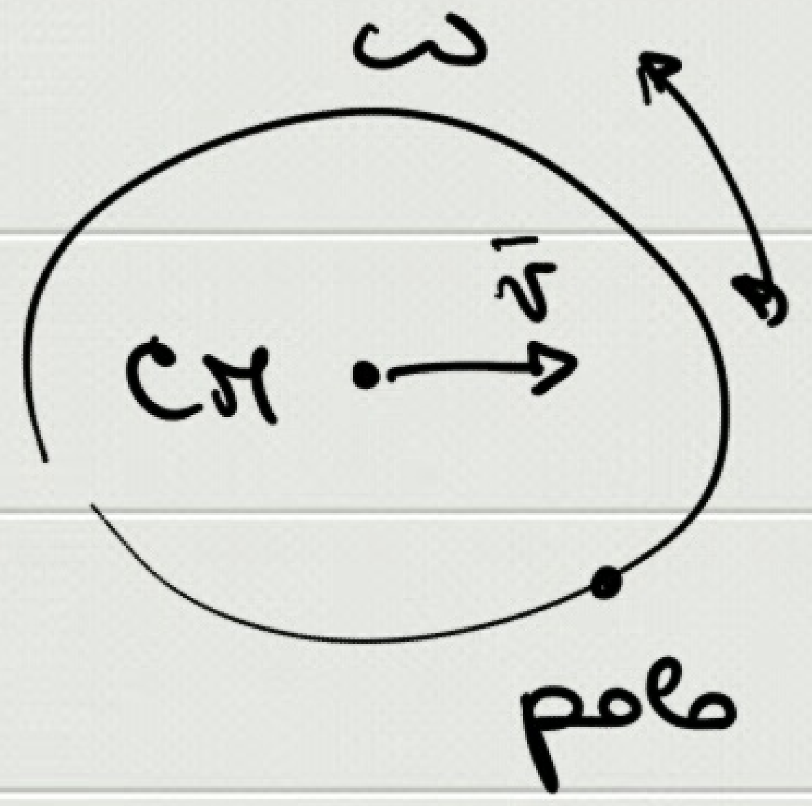
$$\bar{L}_{CM} = \text{cost} \qquad \bar{L}^{+}_{CM} = 0 \quad \Rightarrow \quad \boxed{\bar{L}^{-}_{CM} = 0}$$

$$\bar{L}_0 = \bar{r} \times m\bar{v} \qquad \bar{L}_0 = I_z \bar{\omega}$$

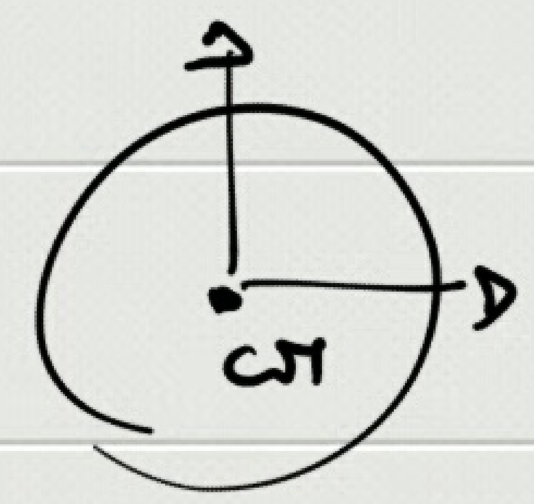


T. di Koenig per $\bar{L}$

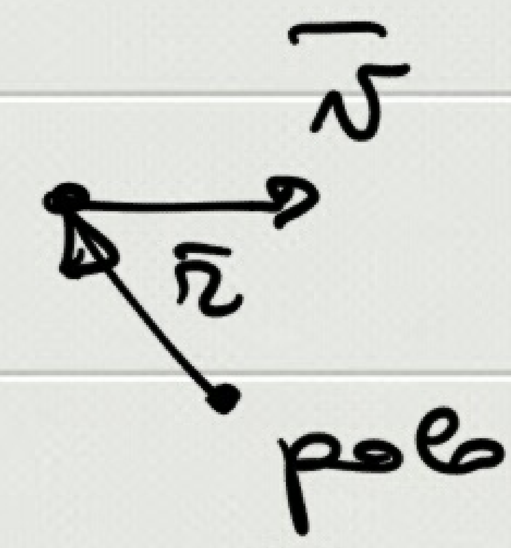
$$\boxed{\bar{L}_0 = \bar{L}'_{CM} + \bar{L}_{0,CM}}$$



$$\bar{L}_{polo} = \bar{L}'_{CM} + \bar{L}_{polo,CM}$$

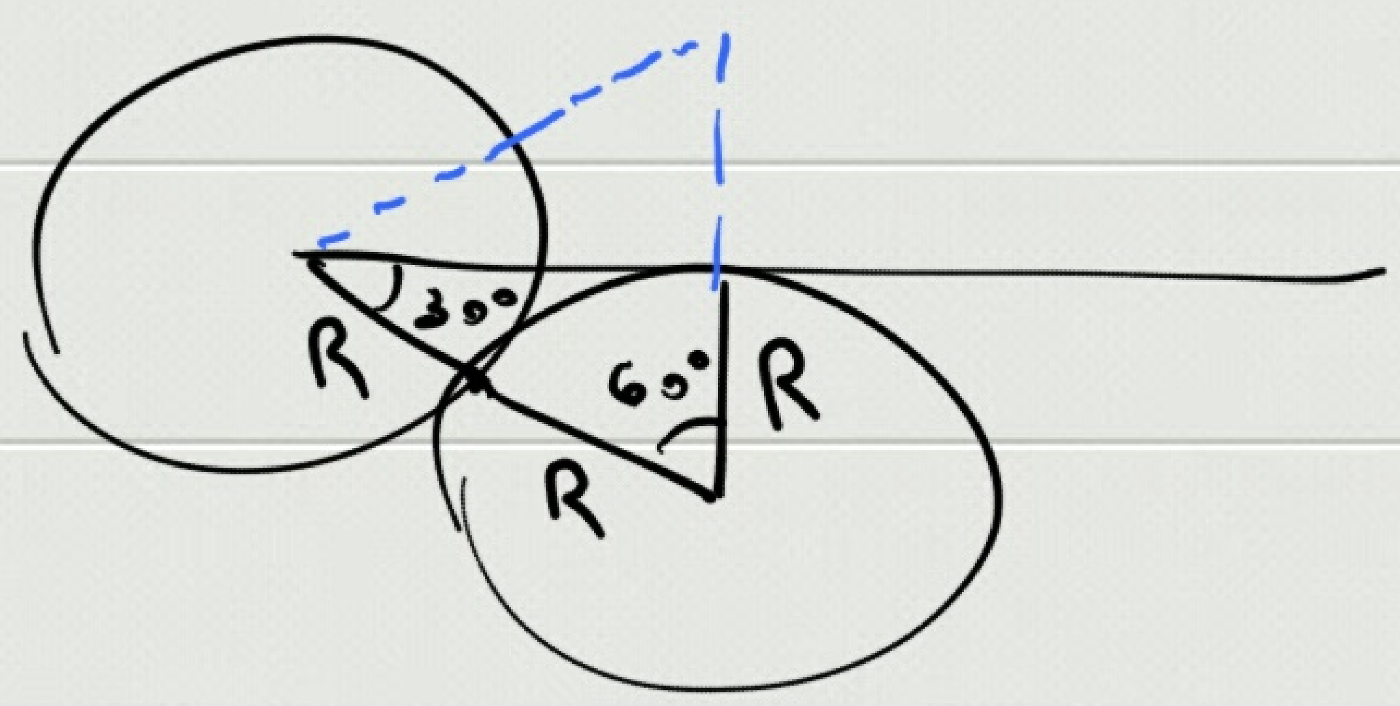


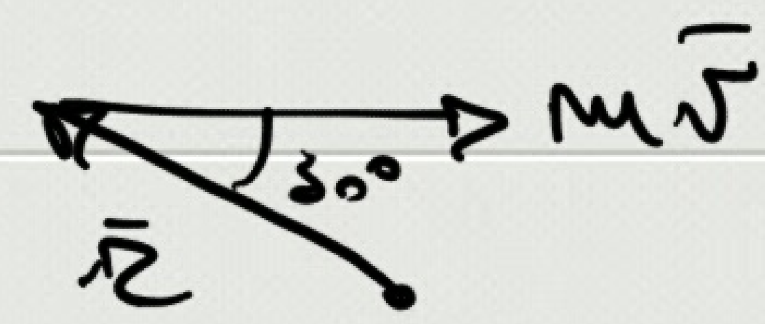
$+\ m$

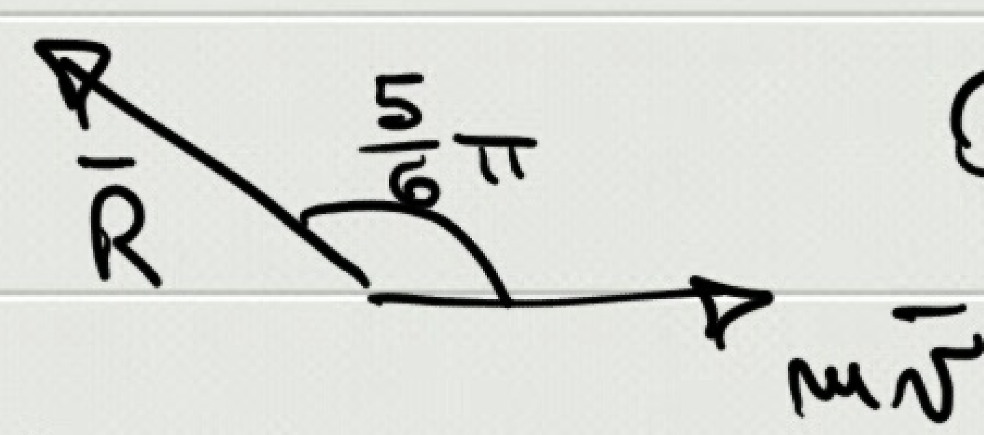


$$I_{CM}\bar{\omega} \qquad \bar{r} \times m\bar{v}$$

$$\Rightarrow \bar{L}_{polo} = \frac{1}{2} m R^2 \bar{\omega} + \bar{r} \times m\bar{v}$$







$\otimes\ \bar{u}_z$

$$\bar{r} \times m\bar{v} = R m v \sin\frac{5}{6}\pi\,\bar{u}_z = \frac{1}{2} R m v\,\bar{u}_z$$

$$\Rightarrow \bar{L}_{polo} = \frac{1}{2} m R^2 \bar{\omega} + \frac{1}{2} R m v\,\bar{u}_z = 0$$

$$\Rightarrow \bar{\omega} = -\frac{v}{R}\bar{u}_z \qquad \boxed{v = \omega R}$$