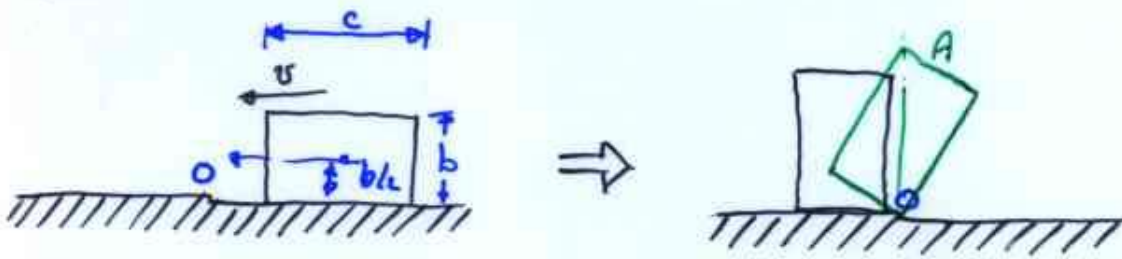


UNIFORM BLOCK SLIDING TO LEFT STRIKES A SMALL STEP AS SHOWN. FIND MINIMUM v S.T. BLOCK CAN PIVOT AND REACH STANDING POSN A SHOWN W/ NO VELOCITY & NO ENERGY LOSS IF $b=c$

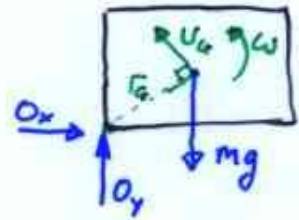


loss
if $b=c$

FREE BODY DIAGRAM

INITIAL ANGULAR MOMENTUM...
just before impact

$$H_0 = m v \left(\frac{b}{2} \right)$$



JUST AFTER IMPACT...

vel of c.o.g. is U_G AS SHOWN ON F.B.D.

ang vel is $\omega = U_G / r_G$ $H_0 = I_0 \omega$

$$\Rightarrow H_0 = \left(\underbrace{\frac{1}{12} m (b^2 + c^2)}_{I_G} + m \underbrace{\left[\left(\frac{c}{2} \right)^2 + \left(\frac{b}{2} \right)^2 \right]}_{(r_G)^2} \right) \omega$$

$$= \frac{m}{3} (b^2 + c^2) \omega = I_0 \omega$$

NEGLECT ANGULAR IMPULSE OF WEIGHT (TIME OF COLLISION IS SHORT SO $\int mg dt$ WILL BE SMALL).

\Rightarrow Apply CONSERVATION OF MOMENTUM... $\Delta H_0 = 0$

$$\Rightarrow \frac{m}{3} (b^2 + c^2) \omega = m v \left(\frac{b}{2} \right) \Rightarrow \left[\omega = \frac{3 v b}{2 (b^2 + c^2)} \right] *$$