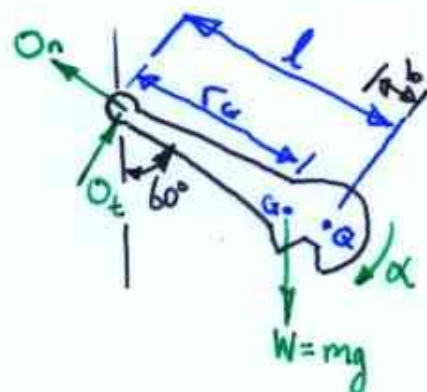


6/48 cont'd

(F5)



at moment of release

find O_t , $O_N \approx \| \vec{O} \|$

since it is just released $\Rightarrow \omega = 0$

$$\sum F_N = m a_n$$

$$O_N - mg \cos 60^\circ = m r \omega^2 = 0 \quad \text{because } \omega = 0 \text{ because just been released.}$$

$$\Rightarrow O_N = mg \cos(60^\circ) = (34)(9.81)(0.5)$$

$$\boxed{O_N = 166.77 \text{ N}}$$

$$\sum M_o = I_o \alpha$$

$$\Rightarrow (mg \sin 60^\circ) r_G = m k_o^2 \alpha$$

$$\Rightarrow \alpha = \frac{(34)(9.81)(0.866)(0.6)}{(34)(0.620)^2} = 13.26 \text{ rad s}^{-2}$$

$$\sum F_t = m a_{Gt}$$

$$\Rightarrow O_t - mg \sin 60^\circ = -m r_G \alpha$$

$$\boxed{O_t = (34)(9.81)(0.866) - (34)(0.6)(13.26) = 18.35 \text{ N}}$$

$$\therefore \| \vec{O} \| = \sqrt{(18.35)^2 + (166.77)^2} = 167.8 \text{ N} \approx O_N$$

Note we could have used centre of percussion

$$\sum M_G = 0 \quad \text{Prop of C. of Percussion}$$

$$\Rightarrow mg(\sin 60^\circ) b - O_t l = 0 ; \quad l = 0.6407 \quad b = 0.0407$$

$$O_t = \frac{mg b \sin 60^\circ}{l} = \frac{(34)(9.81)(0.0407)(0.866)}{0.6407}$$

$$\boxed{O_t = 18.35 \text{ N}} \quad \text{again}$$