

Phys 2110-4

11/2/11

Note Title

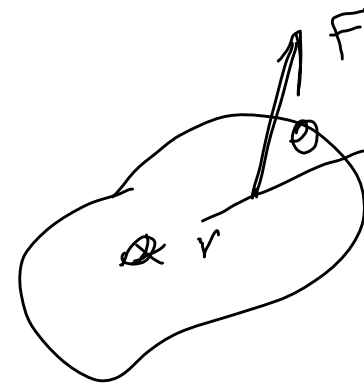
11/2/2011

Rotations Ch 10

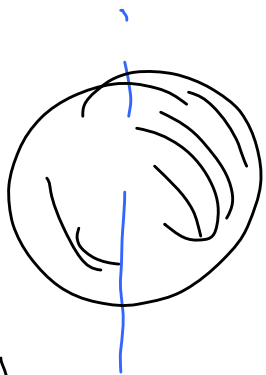
$$\tau = r F \sin \theta$$

$$\tau = I \alpha$$

$$\underline{\underline{\vec{F} = m \vec{a}}}$$

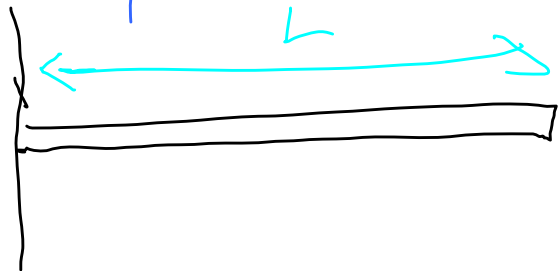


$I$  = moment of inertia = rotational inertia  
 $= \sum_i m_i r_i^2$



Solid sphere

$$I = \frac{2}{5} MR^2$$

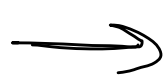


$$I = \frac{1}{3} ML^2$$

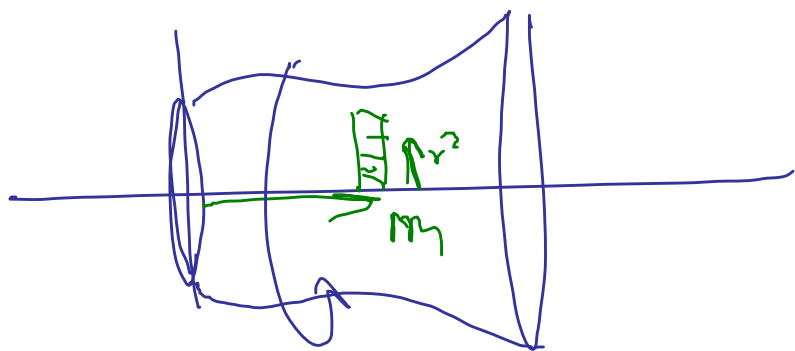


$$I = \frac{1}{12} ML^2$$

$$\tau = I\alpha$$



$$\theta = \theta_0 + \omega_0 t + \frac{1}{2} \alpha t^2$$

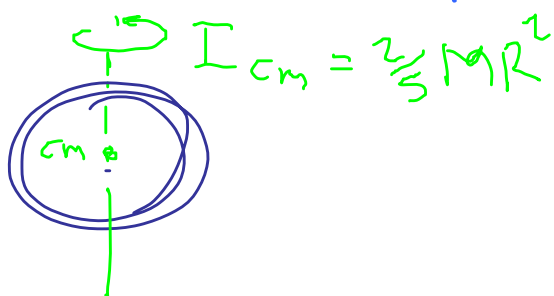


$$\sum m_i r_i^2$$

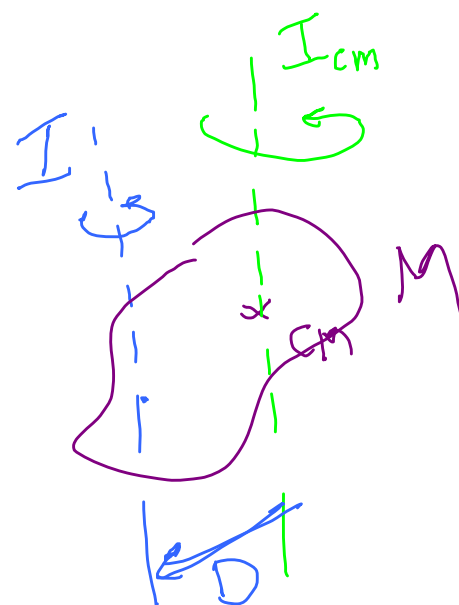
Parallel

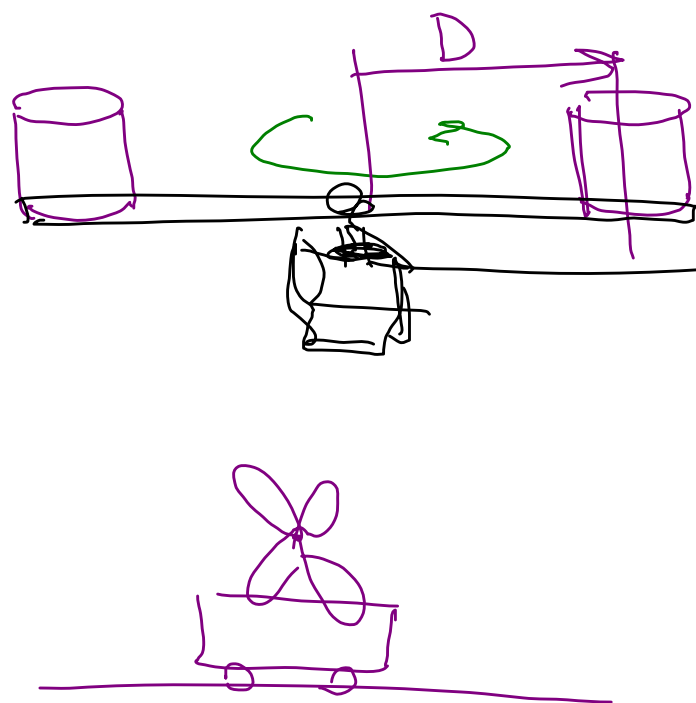
Parallel Axis Theorem

$$I = I_{cm} + MD^2$$



$$I = \frac{2}{5}MR^2 + MR^2 = \frac{7}{5}MR^2$$





$$I_{cm} = \frac{1}{2}MR^2 + MD^2$$



Example

Ideal pulley

Attach mass to string.  
 Wrap string around pulley. Release  
 What is its accel?