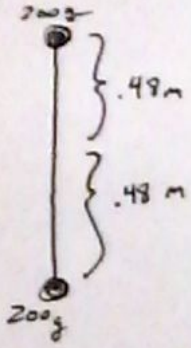
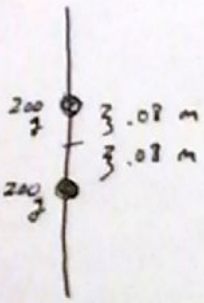
Rotational Inertia

(1)

A:



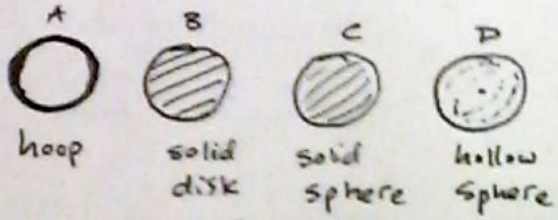


a) Find I for both given a horizontal axis through the meterstickes midpoints (50cm mark).

b.) How does the mass of the meter stick's mass effect your answers in part a.

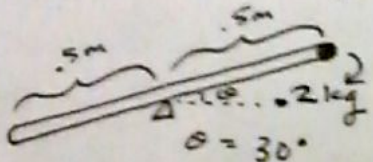
c.) How does rotational inertia differ if the axis of rotation is vertical through the meterstick's?

(2)



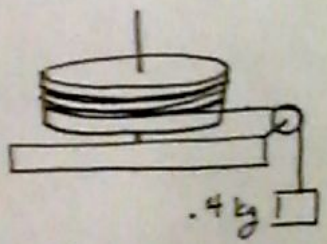
All four have equal radius and mass. Rank inertia from high to low.

(3)



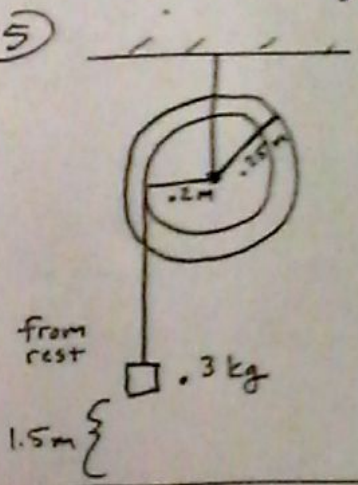
A uniform thin rod: .3kg, 1m long, $I = .025\ kgm^2$
Find α of the assembly, a of .2kg immediately after release from rest.

(4)



Disk M = .5kg, R = .1m, $I = \frac{1}{2} MR^2$
Light pulley. No friction. String does not slip.
$a_{box} = ?$ $\alpha_{disk} = ?$ $T = ?$

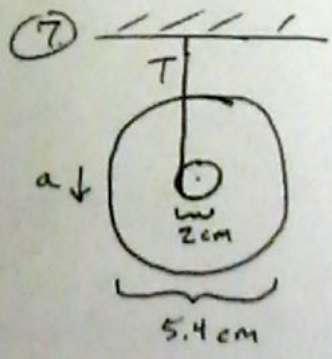
(5)



The box takes 1.1 seconds to strike the floor.
$a_{box} = ?$
$I_{pulley} = ?$

(6) Solve problem 5 using rotational and translational energy concepts.

(7)



Yo-yo
M = 70g
$I = 3.83 \times 10^{-5}\ kgm^2$

* Find a & tension. Released from rest.

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(8) A solid uniform sphere: M, R, $I = \frac{2}{5} MR^2$ rolls without slipping up or down an incline. Find a, α, and Force friction.
a.) Use the force approach. b.) use the energy approach.