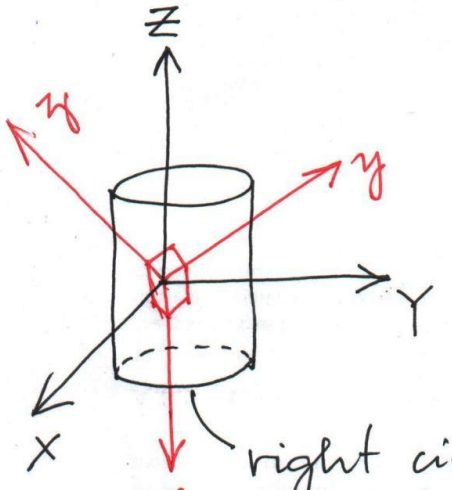
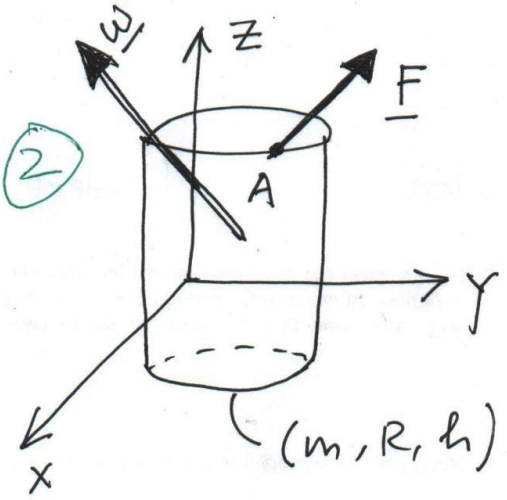
(1)



right circular cylinder (m, R, h)

given relation of xyz to XYZ, find $[\underline{\underline{I}}_{cm}]_{xyz}$

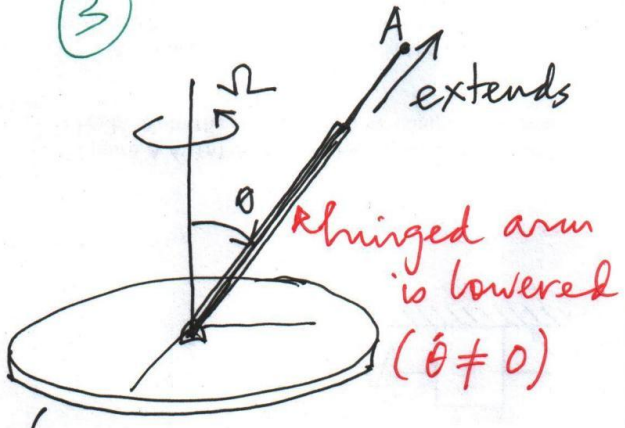
(2)



(m, R, h)

For given cylinder w/ given angular velocity and force at A, find $\underline{\alpha}$.

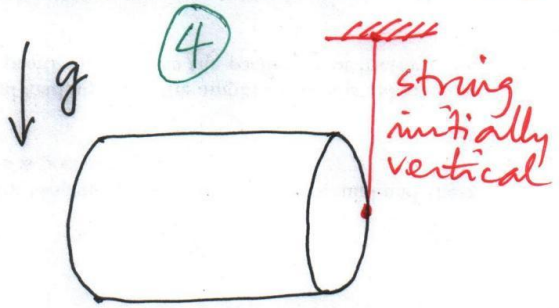
(3)



disk rotates steadily

Find $\underline{a}_A$

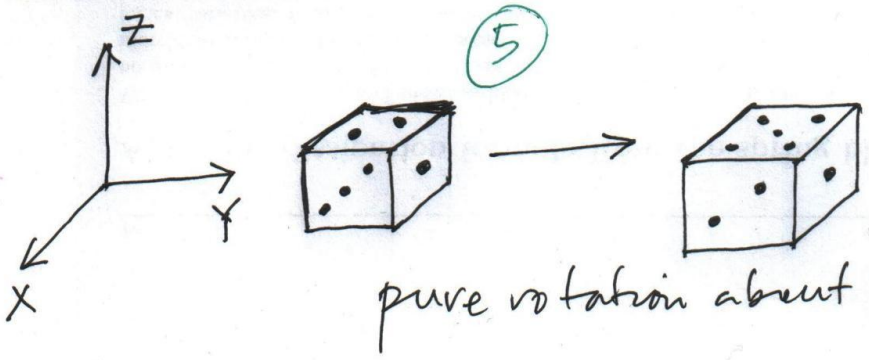
(4)



cylinder (m, R, h) initially horizontal, released from rest.

Find instantaneous angular acceleration of cylinder.

(5)



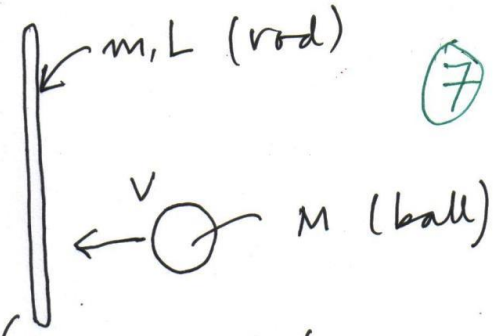
pure rotation about 'j'.

Express in terms of ϕ, θ, ψ, 3-1-2 Euler angles. What are ϕ, θ, ψ?

(up to roundoff error) (ie, accurate to 2 significant digits)

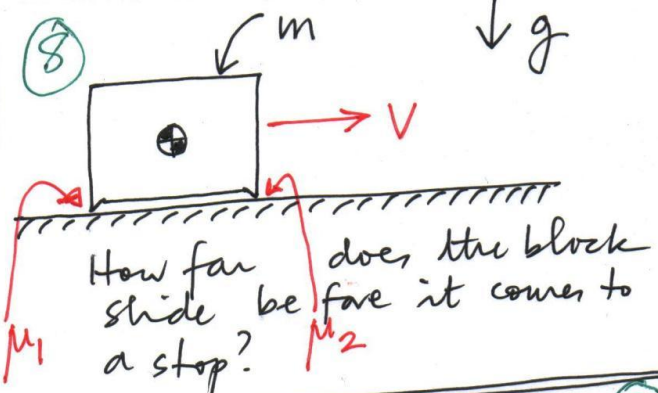
(6) $R(n,\theta) = \begin{bmatrix} -0.66 & -0.41 & -0.63 \\ -0.67 & -0.04 & 0.74 \\ -0.33 & 0.91 & -0.25 \end{bmatrix}$. Find n & θ.

(7)



(initially stationary) $e = 0.7$. Find the velocity of the ball after impact.

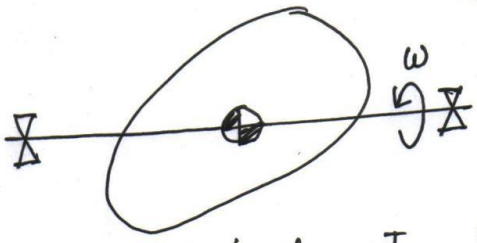
(8)



How far does the block slide before it comes to a stop?

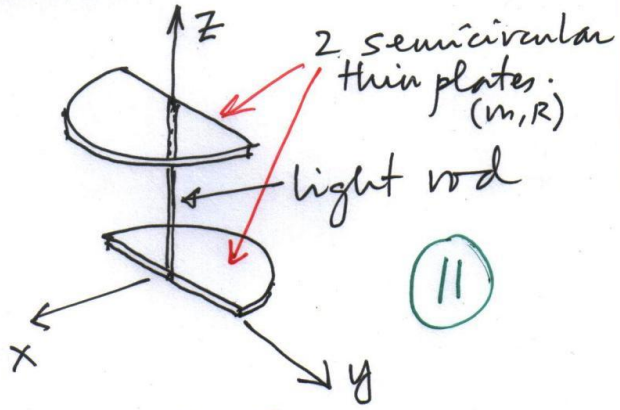
(9) 3-1-3 Euler angles ϕ-θ-ψ; given $\phi = \pi/2$, $\theta = \pi/4$, $\psi = 0$, and $\underline{\omega} = 3\hat{i} + 4\hat{j}\ s^{-1}$, find $\dot{\phi}, \dot{\theta}, \dot{\psi}$.

(10)



crooked body, $\underline{\underline{I}}_{cm}$ known, spins on shaft, find bearing reactions

(11)

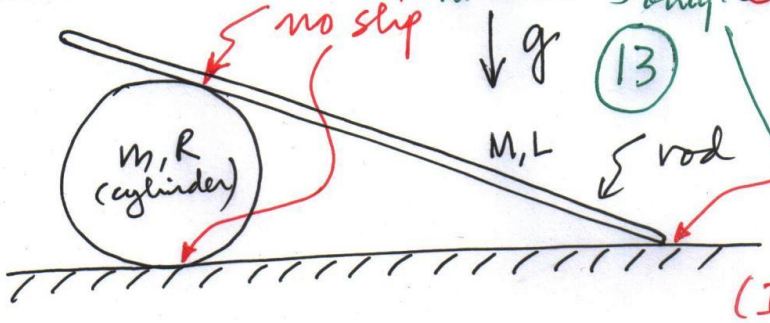


Find $[\underline{\underline{I}}_{cm}]_{xyz}$

(12) For problem 11, find at least one axis about which pure spin under torque-free conditions is possible.

For thinking about only:

(13)



(a) Easy(?) Which direction will the cylinder roll?

(b) Harder(!) If released from rest, what is the initial angular acceleration?

(I will not ask these)