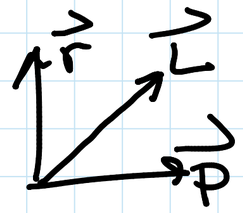
# Phys 121, Fall 2021, Rocket Science Section 6

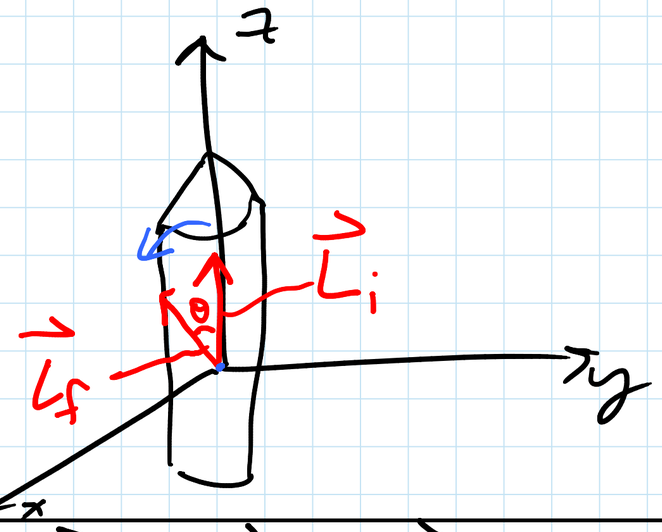
$$\vec{L} = \vec{r} \times \vec{p}$$

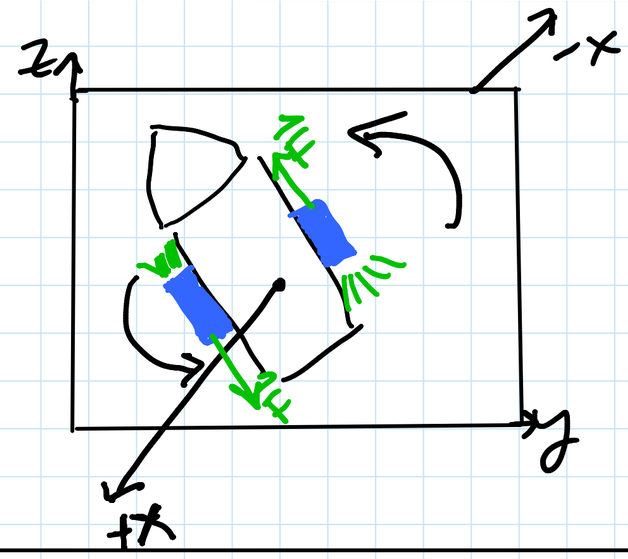


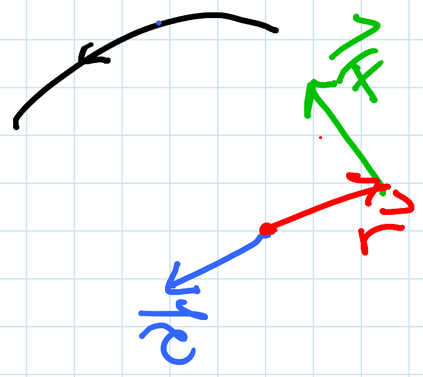

$$\vec{L} = I\vec{\omega}$$

**PART 1**

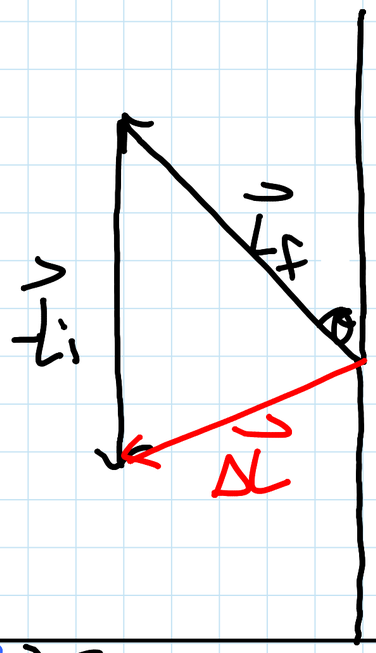
1)



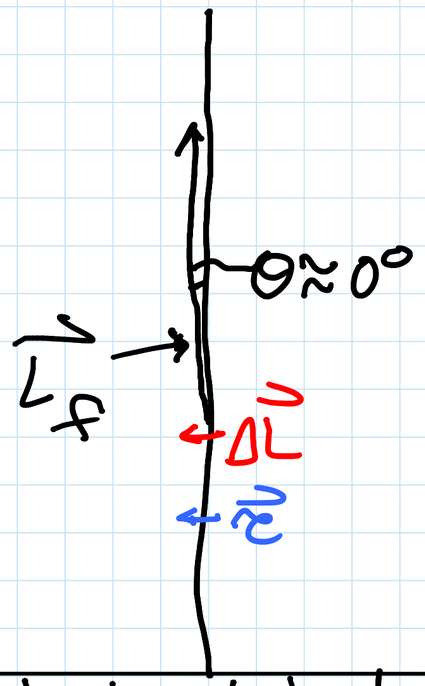




2) $\Delta\vec{L} = \vec{L}_f - \vec{L}_i$




now if $\theta \to 0$,




$$\vec{\tau} = \frac{d\vec{L}}{dt} \qquad \vec{\tau} = \vec{r} \times \vec{F}$$

$$= \lim_{\Delta t \to 0} \frac{\Delta \vec{L}}{\Delta t}$$

**PART 2**

1) Forces must cancel each other while leaving behind a net torque.
2) Next Page of the Problem sheet shows where one or thruster should be.
3) Pulsed Inductive Thruster (PIT) ← blasts are in pulses
   Electrostatic Ion Thruster ← blast is continuous?

$$\text{Impulse} = \int F\,dt = \frac{dp}{dt}$$


Impulse = Area under the curve