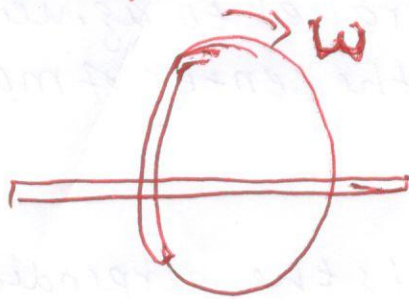


6.3 Rotational kinetic energy

* The amount of kinetic energy of a rigid body has from its rotational movement.



$$KE_r = \frac{1}{2} m v^2 = \frac{1}{2} m (\omega r)^2$$

$$KE_r = \frac{1}{2} m \omega^2 r^2 = \frac{1}{2} I \omega^2$$

$$KE_r = \frac{1}{2} I \omega^2$$

$$\Delta KE_r = \frac{1}{2} I (\omega_f^2 - \omega_o^2)$$

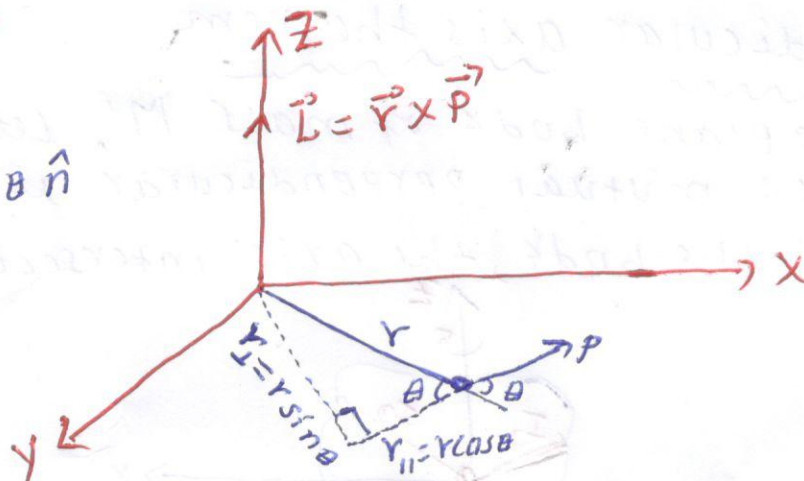
Angular momentum and Angular impulse

* The vector product of its displacement from axis of rotation and linear momentum.

* Consider a particle of mass 'm' moving in the xy-plane with velocity $\vec{v}$ & linear momentum ' $\vec{p}$ ' at a distance 'r' from the origin

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

$$\vec{L} = r p \sin \theta \hat{n}$$



$$L = r_{\perp} p = p_{\perp} r = r p \sin \theta \Rightarrow \vec{L} = m (\vec{r} \times \vec{v})$$

If $\underline{r \perp v} \Rightarrow L = m r (\omega r) = m r^2 \omega = I \omega$

$$L = I \omega$$