Angular Momentum

I can define, analyze, and solve problems involving torque.

Angular Momentum

Angular momentum (L) is equal to the product of the object's moment of inertia and the object's angular velocity.

\[ L = I \omega \]

Angular Impulse

Angular Impulse = \[ \Delta L \]

Angular Impulse = \[ L_f - L_i \]
UNIT 12 IN CLASS PROBLEMS

20. In a light wind, a windmill experiences a constant torque of 255 N·m. If the windmill is initially at rest, what is its angular momentum 2.00 s later?

Conservation of Angular Momentum
If no net external torque acts on an object, then its angular momentum does not change.

\[ \tau \Delta t = \Delta L = 0 \]

Changing M.O.I.

Applications of the Law of Conservation of Momentum
Applications of the Law of Conservation of Momentum

Helicopters

The Right-Hand Rule
Curl the fingers of the right hand in the direction of rotation. The thumb will point in the direction of the angular velocity, $\vec{\omega}$, and angular momentum, $\vec{L}$.

The Vector Nature of Angular Velocity and Momentum
When an object rotates it is said to have an angular velocity, $\vec{\omega}$, and therefore angular momentum, $\vec{L}$. How do we determine the direction of these two vector quantities?

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

Gyroscopic Effect
UNIT 12 PROBLEMS

(1-22)