

Physics lab

[Science](#), [Physics](#)



ROTATIONAL DYNAMICS Torque, moment of inertia, angular acceleration, angular velocity and angular momentum are quantities used to describe rotational dynamics. Similarities are obviously found when comparing linear motion to rotational motion.

1. Torque.

In both three cases different magnitude of torque are applied.

This observation is true and can be explained by the equation where, τ is the absolute torque applied, r is the absolute radius, F is the absolute force applied in the direction of push and θ is the angle of swing. According to the equation the torque applied increases with increase in radius.

2. Conservation of Angular Momentum.

The law of conservation of angular momentum states that, momentum is conserved when no external force is applied. On all the three situations that is, holding hands by my side, stretching my hands and holding masses on my hands while rotating, the law applies since no external force is applied.

Addition of masses increase the torque under the formula $L = I\omega$ where I is a function of mass.

3. Shape and Momentum of Inertia.

A disk shape produces a low momentum of inertia since it has no hollow space (fully occupied mass towards the center of rotation). According to the equation, and disk process low inertia under free fall than ring given a constant kinetic energy.

4. Conservation of Angular Momentum (Again)

As the stool is at rest, angular momentum of the spinning wheel is not conserved since there is an external gravitational force applied due to the

weight of the wheel. The wheel comes to rest again. On rotating the stool the angular momentum is conserved since the rotating stool counteracts the weight of the wheel.

5. Precession of a Spinning Top (Group Demonstration)

The torque produced depend on the rate of change in angular momentum .

Works Cited