Chapter 7

Centripetal acceleration and Torque

Torque

- Torque is the quantity that measures the ability of a force to rotate an object around some axis. Units - Nm
- Lever arm is the perpendicular distance from the axis of rotation to a line drawn along the direction of the force.
- Torque depends on Force and the length of the lever arm.
- Torque = Force x distance (lever arm)


N-m
in-lb
INCH POUNDS

Practice 8A

- #1. Find the torque produced by a 3 N force applied to a door at a perpendicular distance of .25 m from the hinge.
- Known?
- Unknown?
- Equation?

Centripetal Acceleration

- Acceleration that is directed toward the **center** of a circular path is called centripetal acceleration.
- $a_c = V_t^2/r$
- $a_c = r\omega^2$

Centripetal Force

- Force pushed **outwards** when spinning

Practice 7G

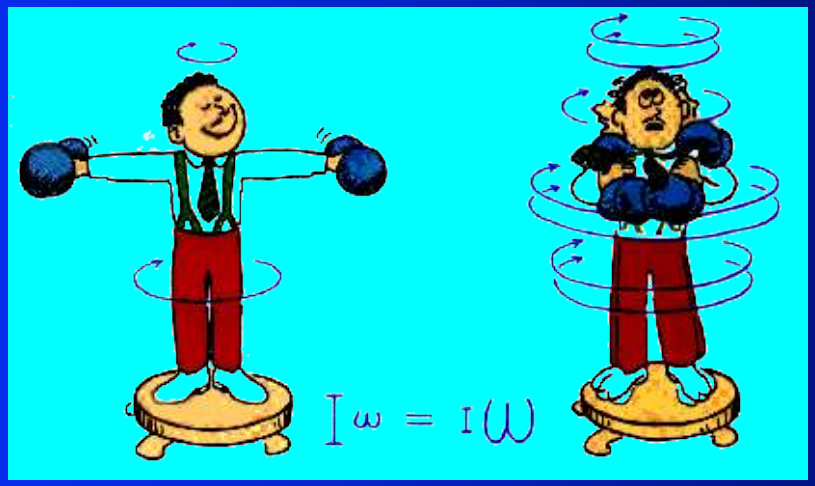
- #1. A girl sits on a tire swing. She has a centripetal acceleration of 3 m/s^2. If the rope is 2.1 m, what is the tangential speed?
- Known?
- Unknown?
- Equation?

Conservation of Angular Momentum

- Angular momentum is conserved
- $F_c = (mv_t^2)/r$
- $F_c = mr\omega^2$

Video

- Spinning Chair Video and then Demo



Practice 7H

- #1. A girl is on a tire swing on a 2.1 m long rope. The dad pushes with a tangential speed of 2.5 m/s. If the force is 88N, what is the girl's mass?
- Known?
- Unknown?
- Equation?

Demos