

## **Chapters/ Sections will be Covered**

Book: Fundamentals of Physics by David Halliday, Jearl Walker, and Robert Resnick

Chapter Title: Rotation

Sections: Kinetic Energy of Rotation

Torque

Angular Momentum

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## Class Activity: Math Problem #1

Practice Problem

Sample Problem 10.11 Work, rotational kinetic energy, torque, disk

Let the disk in Fig. 10-19 start from rest at time  $t = 0$  and also let the tension in the massless cord be  $6.0 \text{ N}$  and the angular acceleration of the disk be  $-24 \text{ rad/s}^2$ . What is its rotational kinetic energy  $K$  at  $t = 2.5 \text{ s}$ ?

## Sample Quiz Question

If work is done by a force, it has a unit Joule ( $1 J = 1 Nm$ ), what is the unit of a torque due to that force?

- a)  $Nm$
- b)  $J$
- c)  $N/m$
- d)  $kgm/s$

What is conservation of angular momentum?

- a) Net torque of a system is constant
- b) Total angular velocity does not change
- c) Total linear momentum does not change
- d) Net angular momentum is constant

## Sample Quiz Question

Where does the concept come from that the rate of change of angular momentum of a system?

- a) From a rigid body rotation
- b) System of particles in a rigid body
- c) Newton's 2nd law of rotation
- d) Conservation of angular momentum

If a rotational rigid body decreases its radius of rotation, what happens to its angular velocity?

- a) Decreases
- b) Increases
- c) Constant
- d) Same initial and final value

## **Probable Final Questions: Lecture 17**

Although torque and work share identical units, distinguish their differences in terms of characteristics.

How is the net torque on a rigid body affected when both internal and external torques are present?

Explain the concept of angular momentum conservation within a system.