**Physics Unit 5 Worksheet 3A**

 Name \_\_\_\_\_\_\_\_\_\_\_\_\_

 Period \_\_ Date \_\_\_\_\_\_

1. A solid sphere, a solid cylinder, and a thin hoop, all of the same diameter and mass, roll down an inclined plane. Which arrives at the bottom first? Which last?
2. Calculate the moment of inertia of a 22.0-kg sphere of radius 0.806 m when the axis of rotation is through its center.
3. Calculate the moment of inertia of a 66.7-cm diameter bicycle wheel. The rim and tire have a combined mass of 1.25 kg.



1. Calculate the net torque about the axle of the wheel shown below.



1. A sphere is rotated about an axis through its center by a torque of 25 N •m, which accelerates it uniformly at 10 rad/s2. What is the rotational inertia of the sphere?
2. A 0.880-kg uniform cylinder with a rotational inertia of 0.744 kg•m2, determine the torque needed to accelerate it from rest to 1200 rpm in 4.00 s.