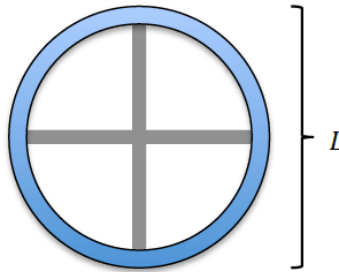


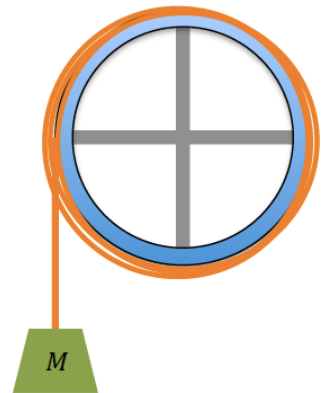
Name: \_\_\_\_\_

**AP Physics 1: Rotational Motion**  
**Moment of Inertia HW**



1. Two thin rods are attached to a thin hoop to create a wheel as shown. The rods both have a mass  $M$  and a length  $L$ . The hoop also has a mass  $M$  and a radius of  $L/2$ . The axis of rotation is at the intersection point of the rods at the center of the hoop.
  - A. Calculate the moment of inertia for the entire system.

2. The same wheel from above is now attached to an axle and is free to rotate. A mass is attached to a string. The mass has a value of (you guessed it!) also  $M$ .
  - A. Determine the angular acceleration of the wheel. Your answer can only be expressed in terms of  $g$ ,  $M$ , and/or  $L$ . (That means you can have numerical coefficients, but no other variables in your answer except the ones mentioned.)



- B. Determine the force of tension. Also express your answer in terms of the same three variables.