Name:_____ **Date:**_____

25. The four particles in Figure P10.25 are connected by rigid rods of negligible mass. The origin is at the center of the rectangle. The system rotates in the xy plane about the z axis with an angular speed of 6.00 rad/s. Calculate (a) the moment of inertia of the system about the z axis and (b) the rotational kinetic energy of the system.

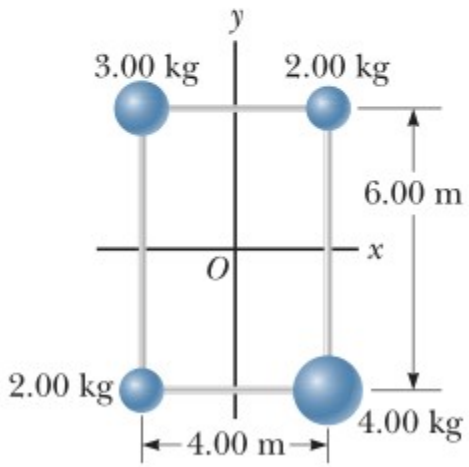

Figure P10.25

Name:_____ Date:_____

26. Q C Rigid rods of negligible mass lying along the y axis connect three particles (Fig. P10.26). The system rotates about the x axis with an angular speed of 2.00 rad/s. Find (a) the moment of inertia about the x axis, (b) the total rotational kinetic energy evaluated from $\frac{1}{2}I\omega^2$, (c) the tangential speed of each particle, and (d) the total kinetic energy evaluated from $\sum \frac{1}{2}m_i v_i^2$. (e) Compare the answers for kinetic energy in parts (a) and (b).

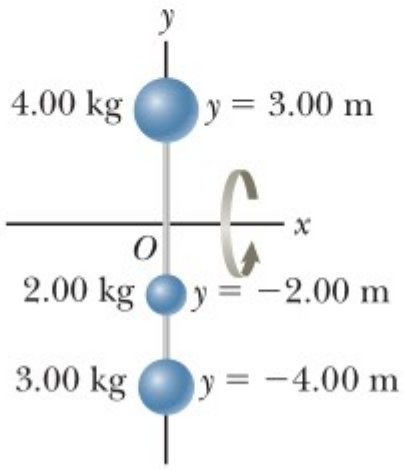

Figure P10.26

Name:_____ **Date:**_____

28. **S** Two balls with masses M and m are connected by a rigid rod of length L and negligible mass as shown in Figure P10.28. For an axis perpendicular to the rod, (a) show that the system has the minimum moment of inertia when the axis passes through the center of mass. (b) Show that this moment of inertia is $I = \mu L^2$, where $\mu = mM/(m + M)$.

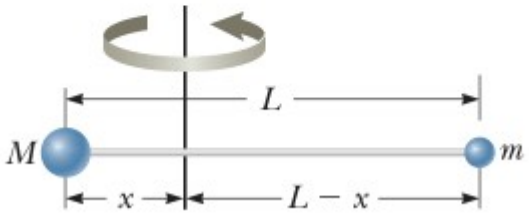

Figure P10.28

Name:_____ **Date:**_____

33. **S** Three identical thin rods, each of length L and mass m, are welded perpendicular to one another as shown in Figure P10.33. The assembly is rotated about an axis that passes through the end of one rod and is parallel to another. Determine the moment of inertia of this structure about this axis.

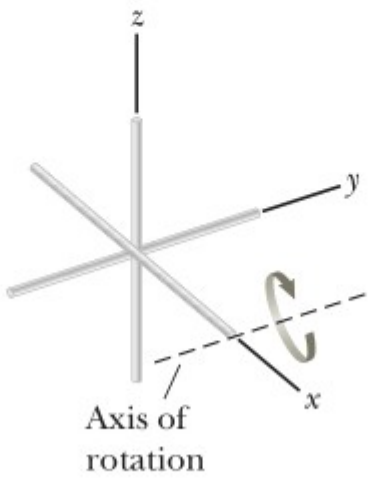

Figure P10.33

Name:_____ **Date:**_____

35. Find the net torque on the wheel in Figure P10.35 about the axle through O, taking $a = 10.0$ cm and $b = 25.0$ cm.

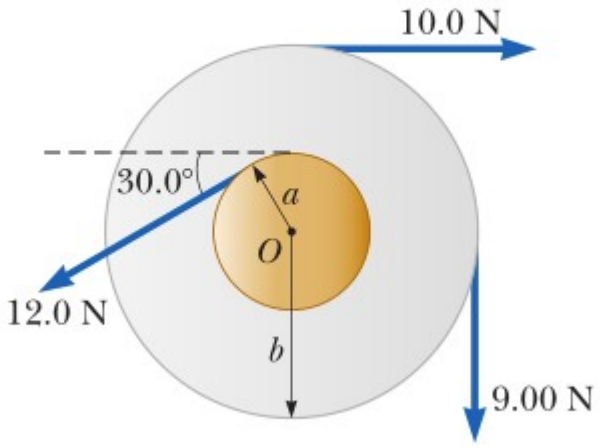

Figure P10.35

Name:_____ **Date:**_____

37. An electric motor turns a flywheel through a drive belt that joins a pulley on the motor and a pulley that is rigidly attached to the flywheel as shown in Figure P10.37. The flywheel is a solid disk with a mass of 80.0 kg and a radius $R = 0.625$ m. It turns on a frictionless axle. Its pulley has much smaller mass and a radius of $r = 0.230$ m. The tension T_u in the upper (taut) segment of the belt is 135 N, and the flywheel has a clockwise angular acceleration of 1.67 rad/s^2. Find the tension in the lower (slack) segment of the belt.

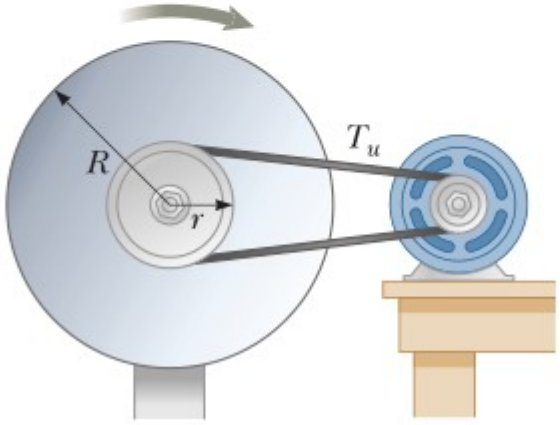

Figure P10.37