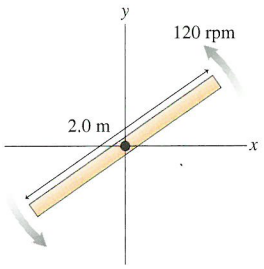
Angular Momentum Practice Name:_____

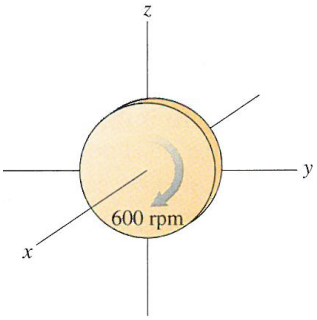
1. What is the angular momentum of the Moon around Earth? The Moon's mass is 7.4×10^{22} kg and it takes 27.3 days to complete one orbit at 3.8×10^{8} m from Earth.

2. A little girl is going on the merry-go-round for the first time and wants her 47 kg mother to stand next to her on the ride--2.6 meters from the center. If her mother's speed is 4.2 m/s when the ride is in motion, what is her angular momentum around the center of the merry-go-round?

3. What is the angular momentum of the 500.0 g bar in the figure below?



4. What is the angular momentum of the 2.0 kg, 4.0 cm diameter rotating disk below?



5. Divers change their body position in midair while rotating about their center of mass. In one dive, the diver leaves the board with her body nearly straight, then tucks into a somersault position. If the moment of inertia of the diver in a straight position is 14 kg*m^2 and in a tucked position is 4.0 kg*m^2, by what factor is her angular velocity greater when tucked rather than straight?

6. Ice skaters often end their performances with spin turns, where they spin very fast about their center of mass with their arms folded in and legs together. Upon ending, their arms extend outward, proclaiming their finish. Not quite as noticeably, one leg goes out as well. Suppose that the moment of inertia of a skater with arms out and one leg extended is 3.2 kg*m^2 and for arms and legs in is 0.80 kg*m^2. If he starts out spinning at 5.0 rev/s, what is his angular speed (in rev/s) when his arms and one leg are open outward?

7. Two disks are rotating about the same axis. Disk A has a moment of inertia of 3.4 kgm^2 and an angular velocity of +7.2 rad/s. Disk B is rotating with an angular velocity of –9.8 rad/s. The two disks are then linked together without the aid of any external torques, so that they rotate as a single unit with an angular velocity of –2.4 rad/s (think inelastic collision). The axis of rotation for this unit is the same as that for the separate disks. What is the moment of inertia of disk B?