

Chapter C14 Practice: Conservation of Angular Momentum

Physics I

College of the Atlantic

1. A 5 kg serving tray with a radius of 20 cm spins at 10 revolutions per minute. A 1 kg coffee cup is placed on the tray 10 cm from the axis of rotation. What is its angular velocity now?
2. A spherical planet is spinning in outer space. The planet suddenly collapses so that its radius is half of what it was before. What is its new angular velocity compared to its old angular velocity? What if its new radius was 10 times smaller than its original radius?
3. For each of the three figures below, a 30 kg child is running at 2 m/s and jumps on a merry-go-round as show below. The merry-go-round has a radius of 1.5 m and a mass of 50 kg. In each instance, how fast is the merry-go-round spinning after the child jumps on it?
4. Suppose there are two 30 kg kids on edge of the merry-go-round and is it spinning at 0.2 rev/sec. The kids move inward on merry-go-round so they are both halfway between the center and the outer edge. How fast is merry-go-round spinning now?

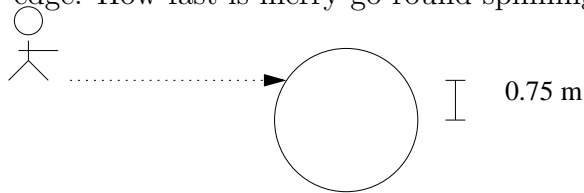


Figure 1:

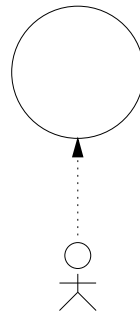


Figure 2:

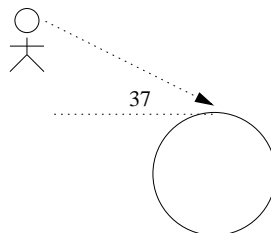


Figure 3: