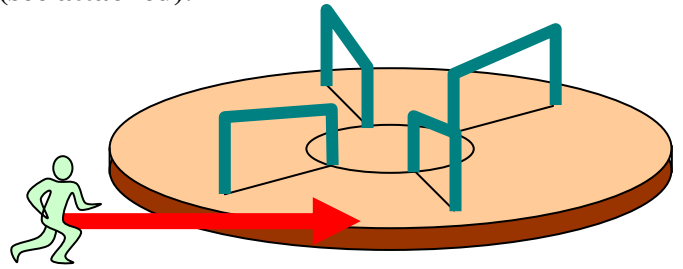


Various Energy and Angular Momentum Examples (see attached).

I. Small playground carousel

A small child ($m = 25 \text{ kg}$) runs ($v = 3 \text{ m/s}$) at a carousel such that he arrives tangentially to the outer edge ($R = 2 \text{ m}$; $I_C = 250 \text{ kgm}^2$), and he grabs the handlebar. As a result, the carousel begins to spin. Find ω and the period T .

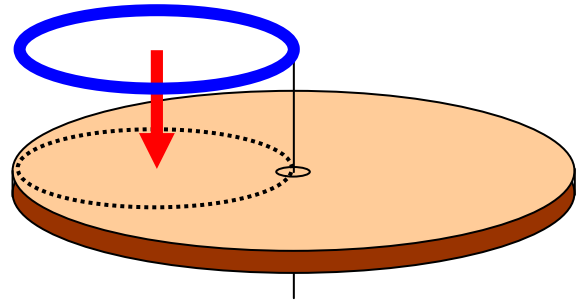


II. Small turntable and a ring

A small cylindrical turntable ($m_1, R_1, \omega_1 = 2 \text{ rad/s}$) is rotating freely without friction.

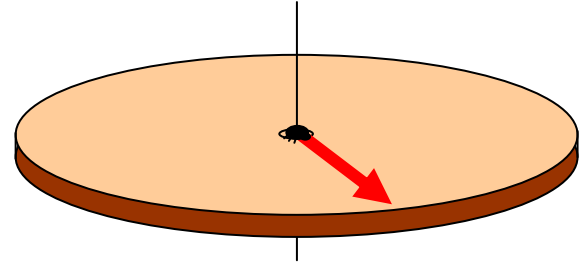
Then, somebody drops a small metal ring ($m_2 = \frac{1}{4}m_1, R_2 = \frac{1}{2}R_1$) onto the turntable such that the edges are tangent.

Determine ω .



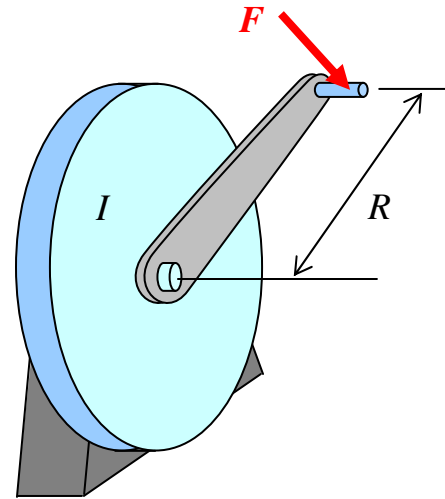
III. Bug on a turntable

A bug ($m_2 = 20 \text{ g} = 0.020 \text{ kg}$) is at the center of a cylindrical turntable ($m_1 = 0.20 \text{ kg}$, $R = 10 \text{ cm} = 0.10 \text{ m}$). The turntable is freely rotating without friction ($\omega_i = 0.50 \text{ rev/s} = 3.142 \text{ rad/s}$). Then, the bug decides to walk to the edge of the turntable. Determine ω_f .



Angular Momentum Example Problem

Handle is attached to disc.
 $R = 30 \text{ cm} = 0.3 \text{ m}$
 $F = 20 \text{ N}$, always perpendicular to R
 $\Delta t = 3 \text{ s}$ (time that handle is pushed)
 $I = 1.4 \text{ kgm}^2$
Starts at rest.
What is final angular velocity?



Angular Energy Example Problem

Starting at rest, a vertical stick falls down. What is the speed of the tip just before the stick hits the ground?

Given: $L = 2 \text{ m}$

