



## Angular Momentum Activity 1 Name: \_\_\_\_\_

$m_1$ : \_\_\_\_\_  $m_2$ : \_\_\_\_\_  $t$ : \_\_\_\_\_  $d$ : \_\_\_\_\_

A person of mass ' $m_1$ ' stands at the center of a merry-go-round of mass ' $m_2$ ' that is rotating once every ' $t$ ' seconds. While it is rotating, the person walks out to the edge of the merry-go-round a distance ' $d$ ' from the center.

What is the rotational period of the merry-go-round when the person gets to the edge?  $(I_1)_i(\omega_1)_i + (I_2)_i(\omega_2)_i = (I_1)_f(\omega_1)_f + (I_2)_f(\omega_2)_f$

(A) Create an equation for initial angular momentum of the system.  
 $I = \frac{1}{2} m R^2$  for a rotating disk.

(B) Create an equation for the final angular momentum of the system.  
 Remember that  $I = m R^2$  for a point mass.

(C) Set the equations from A and B equal to one another  $\vec{L}_i = \vec{L}_f$

(D) Solve for  $\omega_f$  by first solving for  $\omega_i$  ( $\omega = \frac{2\pi}{T}$ )

(E) Convert  $\omega_f$  into  $T_f$  ( $T = \frac{2\pi}{\omega}$ )