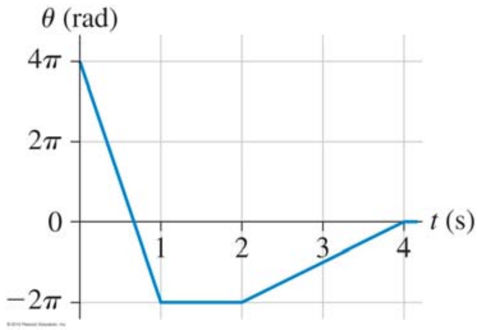
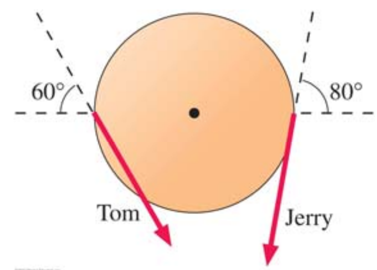
Name:____

1) Consider the following θ vs. *t* graph for an object. Draw the corresponding ω vs. *t* graph. Include appropriate numerical scales on both axes.

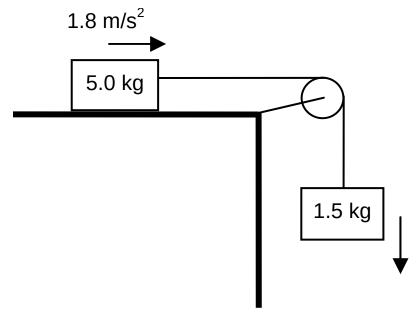


2) The merry-go-round has diameter 2.0 m and moment of inertia 50 kg•m^2. Tom pushes with a force of 20 N, and Jerry pushes with a force of 50 N, as shown in the figure.



a) Determine the net torque on the merry-go-round. The only forces which contribute to the torque are shown.

b) Determine the angular acceleration of the merry-go-round at the instant shown. Also, make sure to indicate whether the angular acceleration is clockwise or counter-clockwise.



3) The figure shows a 5.0 kg block on a horizontal frictionless surface accelerating to the right at 1.8 m/s². The 5.0 kg block is connected by a light rope to a 1.5 kg mass which accelerates down at 1.8 m/s². The rope passes over a pulley (radius 0.30 m, unknown mass) and does not slip.

a) Draw and label force diagrams useful for this situation.

b) Use your diagrams and Newton's second laws $\vec{F}_{net} = m\vec{a}$ and $\vec{\tau}_{net} = I\vec{\alpha}$ to write down equations useful for this situation.

c) Determine the moment of inertia of the pulley.