DO NOT TURN THIS PAGE!!!

Name: _____

Physics 2A Winter 2008 Exam 2 1. A 5.0 kg block is placed on a horizontal surface where $\mu_k=0.3$. The block is then connected to second block of mass 12.0 kg by a massless rope that runs over a massless, frictionless pulley as shown below. The blocks are released from rest. (10 pts)



a) Draw the free-body diagram for each mass separately.

b) Calculate the acceleration of the blocks.

c) Calculate the tension in the rope.

2. A cat is standing on a stationary merry-go-round at a radius of 6.0 m from the center of the ride. Then the operator turns on the ride and brings it up to a rotating rate of one revolution every 4.0 s. Calculate the minimum coefficient of friction so that the cat doesn't "slide off". (10 pts)

- 3. Starting from rest a 50 kg block is pulled up a frictionless 30⁰ incline plane by a constant force of 430N parallel to the incline plane. The block is displaced a total distance of 3.0 m along the incline plane. (15 pts)
 - a) Calculate the work done by the normal force.
 - b) Calculate the work done by gravity.
 - c) Calculate the work done by the 430N force.
 - d) Calculate the net work done on block.
 - e) Calculate the final speed of the block.
 - f) Calculate the average power delivered by the 430N force in 10.0s in moving the block up the incline plane.

 A 10 kg block moving at 7 m/s collides with a horizontal spring (k =500 N/m) in its equilibrium position. Calculate the maximum compression of the spring if surface is frictionless. <u>Use the Work-Kinetic</u> <u>Energy Theorem.</u> (10 pts)

