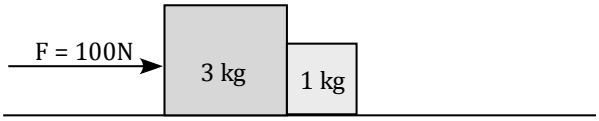
DO NOT TURN THIS PAGE!!!!!

NAME: _____

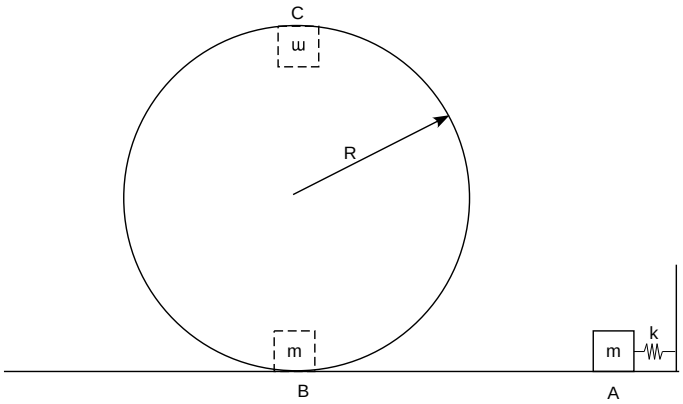
PHYSICS 4A
FALL 2012
EXAM 2

PARTIAL CREDIT will be given so do what you can and make sure that you show all work for each problem. **No credit will be given if no work is shown**. The point value of each question is indicated. Express all answers in SI units.

1. In the figure below the force F = 100 N accelerates both blocks to the right. Taking $\mu_K = 0.3$ between the blocks and the surface calculate the force the 1 kg block exerts on the 3 kg block. (10 pts)



2. A 0.5 kg block is pushed against a horizontal spring with spring constant 450 N/m. The block is then launched from rest on a horizontal, frictionless surface until it reaches a circular loop of radius 2.0 m. While the block is moving along the loop it experiences a constant kinetic frictional force of 8.0 N. Calculate the minimum compression of the spring if the block is to just make it around the loop. (Note: Frictionless between point A and B. Friction between point B and C.) **Use Work-Energy Methods to solve this problem.** Recall that $W_g = mgy_i - mgy_f$. (15 pts)



3. A uniform noodle with linear mass density $\lambda = \frac{M}{L}$ has an amount '*y*' dangling over a table with coefficient of kinetic and static friction μ_k and μ_s respectively. (15 pts)

a) Assuming the noodle slides off the table-top if released from rest, find the minimum force F_{min} to keep noodle from sliding off the table.
b) If noodle is now released from rest, find the acceleration of the noodle.
c) If $\mu_k = 0$, find the work required to pull the hanging part back onto the table-top.