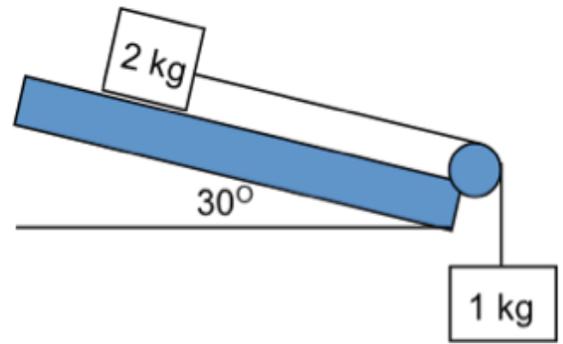


Problem Set #6 due in class, **Friday**, Feb. 19

#1 The system at right is started from rest. The coefficient of friction is 0.3. The strings and pulleys are massless and frictionless. The 1 kg mass hits the ground after falling 2 meters



- How many joules in heat were liberated in the process?
- What is the change in potential energy as the system falls?
- without using any kinematic equations, find the speed of the system when the 1 kg mass strikes the floor. What physics concept is used?
- Using the information above, find the average speed, the time of the fall and the acceleration of the system.
- The tension in the string is just 10 N, right? Find the tension in the string.
- There is a bracket holding the massless, frictionless pulley wheel in place. What is the force that this bracket provides to the pulley wheel? Please provide direction and magnitude and/or a drawing.

#2. Solve the above problem using dynamics as a system. Find the acceleration, tension in the string, and *then* the final speed.

#3. Solve the above problem using dynamics as two connected masses, solving the dynamics for each mass. Find the acceleration, tension in the string, and final speed.

Which of the three methods #1, #2, or #3 do you like the most?