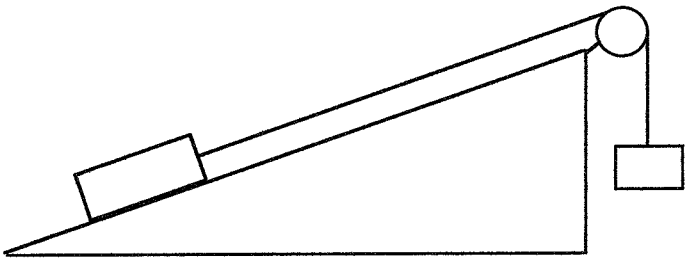
Phys 10154 - Fall 2006 - Exam #5A

Be sure to answer with the proper units and significant figures. Indicate your answers clearly with boxes. SHOW ALL WORK. Even if your answer is correct, I will deduct points if I can't see how you solved the problem. Both problems are worth 50 points.

1. A 12-kg mass is initially at rest on a 24° frictionless incline as shown below. It is connected by a massless string over a frictionless, massless pulley to a 6.5-kg hanging mass. The masses each move a distance of 1.5 meters (the 12-kg mass moves 1.5 meters up the ramp, and the 6.5-kg mass falls 1.5 meters).

What is the final speed of the 12-kg mass?



2. A 4.0-kg mass is held initially at rest on a spring compressed by 25 cm from its equilibrium position. The spring constant is 1200 N/m. After the block leaves the spring, it travels another 3.6 meters before coming to rest. All of the motion takes place on a rough tabletop.

Find the coefficient of kinetic friction of the tabletop.