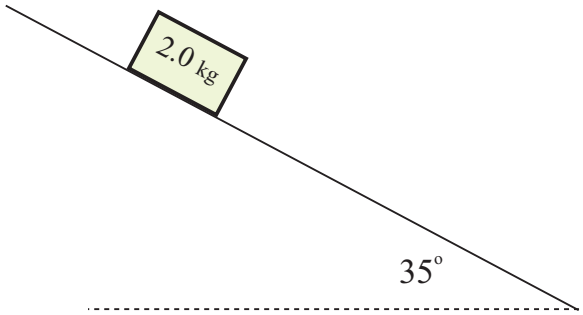
**Name**_____

**Phys 2010 (NSCC), Fall 2005**
**Problem Set #6**

**1.** A 2.0−kg mass slides down a *rough* inclined plane which is sloped at 35° above the horizontal. A student measures its acceleration down the slope and finds it ot be 3.90 $\frac{\text{m}}{\text{s}^2}$.

What is the magnitude of the (kinetic) frictional force which acts on the block?




**2.** In problem 1, what is the magnitude of the normal force of the surface, and what is the coefficient of kinetic friction for the block and surface?

**3.** A hockey puck begins sliding on a flat smooth surface at with speed of $28.0\,\frac{\text{m}}{\text{s}}$. The coefficient of kinetic friction for the puck and surface is 0.050.

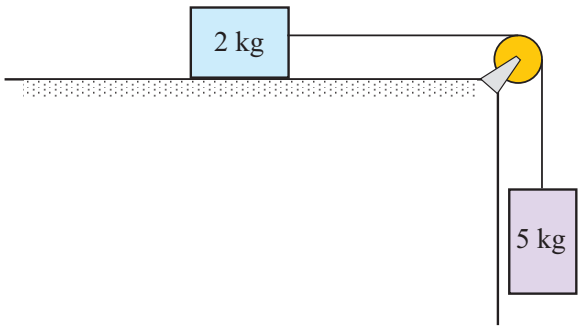
What is the magnitude of the acceleration of the hockey puck?

**4.** How far will the puck go before coming to rest?

**5.** Two masses ($m_1 = 2.0$ kg and $m_2 = 5.0$ kg) are connected by a string which runs over an ideal pulley. $m_1$ slides on a *rough table* and mass $m_2$ hangs freely.

The masses are released and it is found that the acceleration of the masses is $5.8\,\frac{\text{m}}{\text{s}^2}$.

What is the tension in the string? (Think of the forces acting on $m_2$.)




**6.** What is the magnitude of the friction force acting on $m_1$? (Use the value of the tension found in 5.) What is the coefficient of kinetic friction for the sliding block and the surface?

**7.** A 2.0−kg mass moves in a circle of radius 1.2 m. It makes one revolution in 0.960 s.

What is the speed of the mass? What is the centripetal acceleration of the mass? What is the centripetal force which acts on the mass?

**8.** The planet Saturn has a mass of $5.69 \times 10^{26}$ kg. The moon Dione orbits at a distance of $3.774 \times 10^{8}$ m from its center. Find the period of the orbit of Dione. (It will be much easier to use the formula derived in class.)