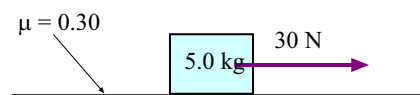


Name _____

Phys 2010 (NSCC), Fall 2007
Problem Set #7

1. A 5.0 kg block is dragged over a rough horizontal surface with coefficient of kinetic friction $\mu_k = 0.30$ by an applied force of magnitude 30.0 N.

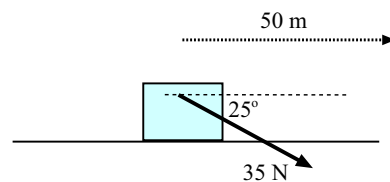


The block starts from rest and is dragged for a distance of 3.0 m.

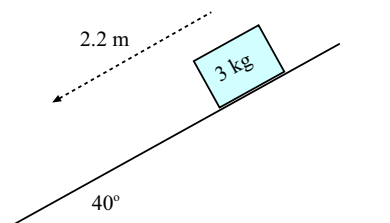
What is the work done by the applied force? What is the magnitude of the friction force on the block? What is the work done by friction?

2. In Problem 1, use the work-energy theorem and the results of 1 to find the final speed of block after it has moved the 3.0 m.

3. A shopper in a supermarket pushes a cart with a force of 35 N directed at an angle of 25° downward from the horizontal. Find the work done by the shopper as she moves down a 50.0-m length of aisle.

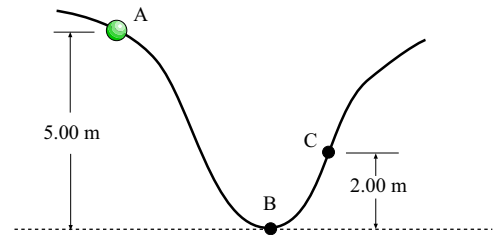


4. A 3.0 kg mass slides 2.2 m down the slope of a 40° incline. Find the change in its gravitational potential energy. (Is it positive or negative?)

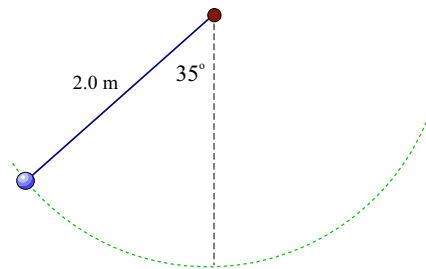


5. A 60-kg pole vaulter running at $10.0 \frac{\text{m}}{\text{s}}$ vaults over the bar. Her speed when she is above the bar is $1.2 \frac{\text{m}}{\text{s}}$. Neglect air resistance as well as any energy absorbed by the pole and determine her altitude as she crosses the bar.

6. A 2.00-kg bead slides on a curved wire, starting from rest at point A. If the wire is frictionless, find the speed of the bead at B and at C.



7. A 2.0-m long pendulum is released from rest when the support string is at an angle of 35° from the vertical. What is the speed of the bob at the bottom of the swing?



8. A 70-kg diver steps off a 10-m tower and drops from rest straight down into the water. If he comes to rest 5.0 m beneath the surface, determine: (a) The work done on him by the resistive force of the water, and (b) the average resistive force exerted on him by the water.

Hint: Find ΔKE and ΔPE for the entire trip then use this to get the work done by the friction force which is from the water. This force opposes his motion for the 5.0 m that he was moving in the water.

