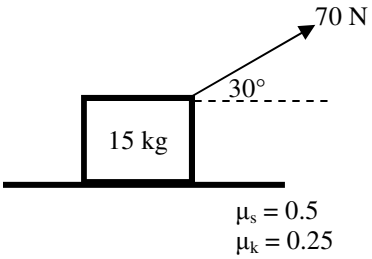
A-Day: Due Mon., Oct 20 (Assigned: 10/16)
B-Day: Due Tues., Oct 21 (Assigned: 10/17)

2008 PreAP Forces 3

1. For the object at the right
   A) Find the normal force on the object at the right.

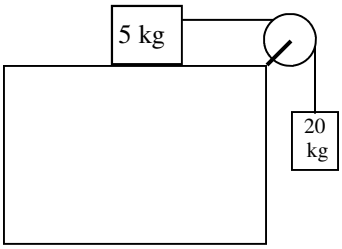


   B) Find the static and kinetic friction acting on the object.

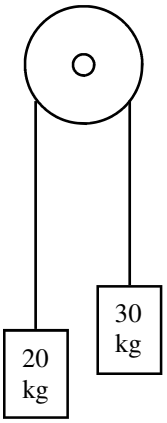
   C) Will the object move and why?

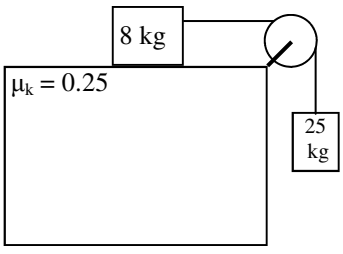
   D) If it does move find acceleration. If it doesn't move, how much more force is necessary to move it.

2. Find the tension and acceleration of the system if there is no friction on the table.



3. Find the acceleration and tension of the two objects on the pulley.
   Assume the pulley has very little mass and no friction.





4. A. Find the normal force on the 8 kg object.

   B. Find the force of static friction on the object.

   C. Find the tension in the rope and the acceleration.

More on Back

5. A. A 50 kg child stands on a bathroom scale. The scale measure weight, what does it read?

   B. The student then takes the scale into an elevator. While the elevator is stopped, what does the scale read?

   C. While the elevator moves between floors at a constant speed, what does the scale read?

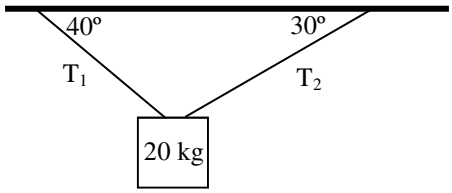
   D. If the elevator moves up at 3.5 m/s^2, what does the scale read?

   E. If the elevator moves down at 4 m/s^2, what does the scale read?

6. A car going 35 m/s stops in 120 m.
   A. Find the acceleration of the car.

   B. If the car has a mass of 550 kg, find the force of the car's brakes while stopping.

*Let me show you how powerful $\Sigma F_x = ma_x$ and $\Sigma F_y = ma_y$ are. The biggest hint I can give you is to trust the process and NOT worry about the answer. The **process** will **give** you the answer.*



7. An object is suspended by two different ropes.
   A. Since the two ropes are different are the tensions the same?

   B. Draw the x and y components labeling them with sin and cos as appropriate. (Ex.: $T_1x = T_1\sin 40° = .64T_1$)

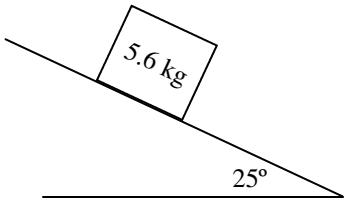
   C. Label any other forces acting on the 20 kg mass.

   D. Since the object is hanging (stationary), what is the acceleration of the object?

   E. Write $\Sigma F_x = ma_x$ and $\Sigma F_y = ma_y$.

   F. Calculate each rope's tension.

$\mu_s = 0.3$
$\mu_k = 0.2$



8. Decide whether or not the object on the ramp will slide or not. If it will slide, find the acceleration. If it doesn't slide, what additional force is necessary to make it move.

9. If the mass were decreased to 2 kg how would this change the acceleration of the object?

10. How does the mass affect the minimum angle that the mass will slide?