A-Day: Due Wed., Oct 21
B-Day: Due Thurs., Oct 22

2009 Forces 1

You will need these notes: "Forces and Newton's First Law"; "Types of Forces".

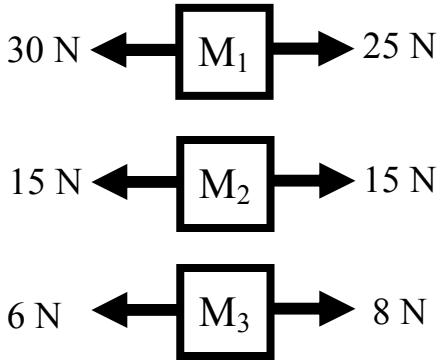
1. For each of the following pairs of objects, which one has more inertia?

   A. A freight train or a car?
   B. A ping pong ball or a baseball?
   C. A fast bowling ball or a slow bowling ball?
   D. A 20 kg mass or a 10 kg mass?
   E. A rock on the earth or a rock in space?
   F. A fast baseball or a bowling ball at rest?

2. Identify the following forces as F (applied), T, F_W, F_f (friction), or F_N.

   A. _____ Due to a string.
   B. _____ Opposes weight for objects on surfaces.
   C. _____ You push down on an object on a table, this increase.
   D. _____ Caused by gravity.
   E. _____ Would decrease on the moon.
   F. _____ Decreases if a surface is smooth.
   G. ____ You place a heavy object onto a board. The board will break if this is too small.
   H. ____ Always vertical.
   I. ____ If a surface is tilted, this changes direction, too.
   J. ____ Has the units of newtons.
   K. ____ Doesn't exist for hanging objects.

3. While a force is acting on an object, give three things that can happen.



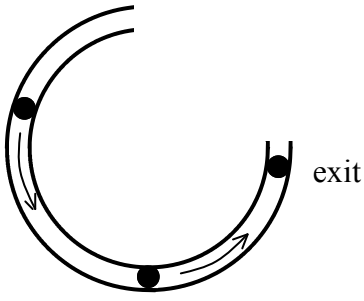
4. What is the net force on M_1?

5. What is the net force on M_2?

6. What is the net force on M_3?

7. Which of the above masses: M_1, M_2, or M_3?

   A. ____ Which could be at rest?
   B. ____ Acceleration is negative.
   C. ____ Acceleration is positive.
   D. ____ Has a net force of 0 N.
   E. ____ Has a net force (Fnet ≠0)
   F. ____ Has balanced forces.
   G. ____ Could be changing direction.
   H. ____ Has unbalanced forces.
   I. ____ Could be a constant speed.
   J. ____ Could be slowing down to the left.



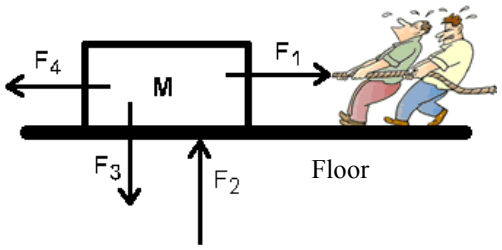
8. A ball is moving inside a tube, as shown on the diagram at the left.
   A. When it leaves the tube, will it have a circular path or a straight path?

   B. What do we call any force that keeps an object moving in a circular path?

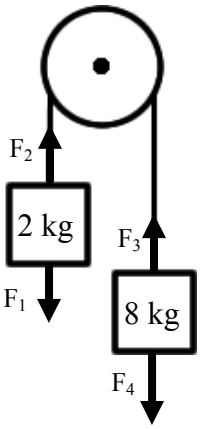
9. Static or kinetic friction?

   A. ____ Is slipping friction.
   B. ____ Is gripping friction.
   C. ____ Acts to keep an object from moving.
   D. ____ Tries to stop an object that is already sliding.

10. Two very small people are pulling a box. Identify the four shown forces as $F_{Applied}$; T; F_W; F_N.



   A. _____ F_1— the two men pulling WITH A ROPE.
   B. _____ F_2— the force pushing up by the floor.
   C. _____ F_3— the force pulling down on the mass.
   D. _____ F_4— the force trying to stop the mass from moving.
   E. _____ Which force is in the negative x-direction?
   F. _____ Which force is in the positive y-direction?
   G. _____ Which force is in the positive x-direction?
   H. _____ Which force is in the negative y-direction?
   I. Which forces would be used in this equation: $\Sigma F_y = ma_y$?
   J. Which forces would be used in this equation: $\Sigma F_x = ma_x$?



11. Two masses are attached by a rope that is threaded around a pulley, as shown. Identify the four forces.

   A. ____ F_1— force pulling down on the 2 kg mass.
   B. ____ F_2— the force of the rope pulling up on the 2 kg mass.
   C. ____ F_3— the force pulling up on the 8 kg mass.
   D. ____ F_4— the force pulling down on the 8 kg mass.
   E. Which two forces are equal?
   F. Why?

   G. Calculate F1.

   H. Calculate F4.

   I. Which forces are y-direction forces?

   J. Which forces are x-direction forces?