Instructions: Complete these problems on separate paper. On ALL questions (yes, even multiple choice), you must:
1. *Draw a picture or diagram* to visualize the problem
2. *Show each step of your calculations clearly*
3. *Write a few sentences* explaining important steps and discussing the reasonableness of your result.

It is ok to collaborate with your peers, but the work must be your own.

You must take assignments seriously to learn physics

1. Multiple Choice: A ball which is dropped from the top of a building strikes the ground with a speed of 30 m/s. Assume air resistance can be ignored. The height of the building is approximately:
   A. 15 m
   B. 30 m
   C. 45 m
   D. 75 m
   E. 90 m

2. Multiple Choice: A 50.-N horizontal force is needed to keep an object weighing 500. N moving at a constant velocity of 2.0 m/s across a horizontal surface. The magnitude of the frictional force acting on the object is
   A. 500. N
   B. 450. N
   C. 50. N
   D. 0 N

3. Multiple Choice: The diagram below shows a block on a horizontal frictionless surface. A 100.-N force acts on the block at an angle of 30.° above the horizontal.

   Frictionless Surface
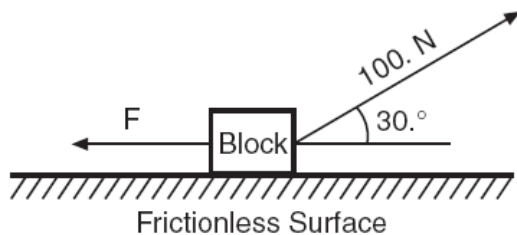
   What is the magnitude of force **F** if it establishes equilibrium?
   A. 50.0 N
   B. 86.6 N
   C. 100. N
   D. 187 N

4. A spring scale reads 15 N as it pulls a 5-kg block across a table at constant speed. What is the coefficient of kinetic friction between the block and the table?
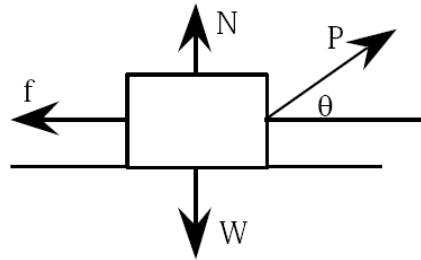
5. Multiple Choice: A student pulls a wooden box along a rough horizontal floor at constant speed by means of a force P as shown above. Which of the following must be true?
   (A) $P > f$ and $N < W$.
   (B) $P > f$ and $N = W$.
   (C) $P = f$ and $N > W$.
   (D) $P = f$ and $N = W$.
   (E) $P < f$ and $N = W$.

"You don't have to be a fantastic hero to do certain things. You can be just an ordinary chap, sufficiently motivated to reach challenging goals."
- Sir Edmund Hillary