Name: _____

AP Physics: Dynamics
Newton's Laws and Forces of Tension HW

Multiple Choice

1. If the net force acting on a cart doubles, what happens to the cart's acceleration?
   A. It quarters
   B. It halves
   C. It stays the same
   D. It doubles
   E. It quadruples

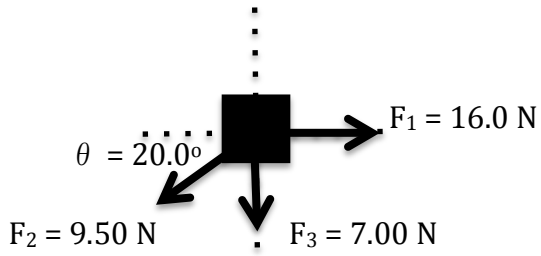
2. Suppose a cart is being moved by a force. If suddenly a load is dumped into the cart so that the cart's mass doubles, what happens to the cart's acceleration?
   A. It quarters
   B. It halves
   C. It stays the same
   D. It doubles
   E. It quadruples

3. The mass of a sheep that weighs 110 N is about
   A. 1.0 kg
   B. 11.0 kg
   C. 110.0 kg
   D. 1100 kg
   E. None of the above

Mathematical Questions: (All work must be shown)

4. A student is pulling a box down a hallway using a force of 185 N directed upwards by 25.0°. The box has a mass of 35.0 kg and the coefficient of kinetic friction is 0.270 The box accelerates to the right under this force
   Equilibrium or Non-equilibrium ΣF_x: _____
   Equilibrium or Non-equilibrium ΣF_y: _____
   A. Draw a FBD
   B. Write a statement for ΣF_x and ΣF_y
   C. What is the value of the normal force?
   D. What is the acceleration of the box to the right?

5. For the object below, calculate the ΣF_x and ΣF_y based on the three forces shown. Find the magnitude and direction (angle) of the resultant or net force.



6. Two water pails are connected together with a massless cord. Both have a mass of 3.20 kg.
   A. What is the tension in each of the cord if the system is in equilibrium?
   B. If the pails are pulled upward with an acceleration of 1.60 m/s^2, calculate the tension in each cord.

7. A street sign is hung between two buildings 10.0 m apart. The wire supporting the sign is now pulled down by the 50.0 kg mass of the sign to make a 10.0° with the horizontal. See image below. What is the tension in the wire?