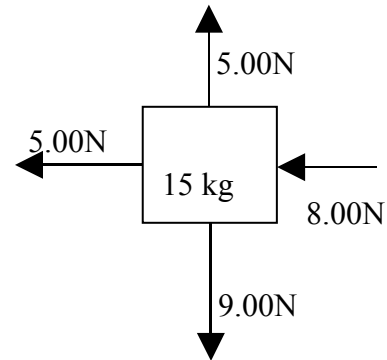


You may answer as many questions as you like. Please use the paper I have provided in your envelope. This must be passed in before 8am on Monday. Please read and sign the honor statement on the front of the folder before you start.

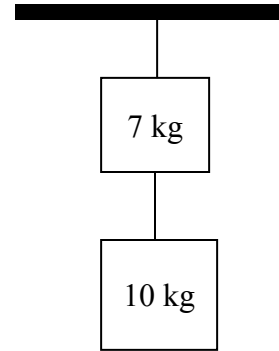
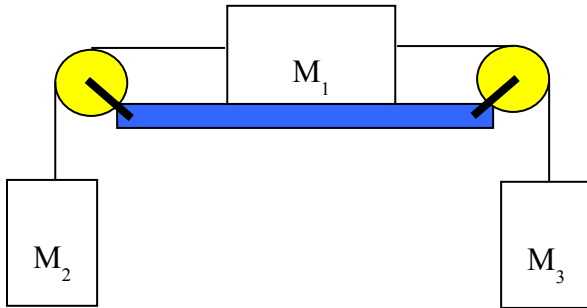
Your Reasons must be Free-body diagrams

1. How is Mass different from Weight? (10)(RO)
2. Show your understanding of Newton's Third Law. (10)(RO)
3. An ideal Atwood machine is set up with two weights. One of the weights is 3.00 kg and the other is 5.00 kg. What is the acceleration of the system? (20)
4. Cordy decides to follow Charley Brown's example and sled down a hill in a box. The hill is inclined to the horizontal at an angle of 35.0° . If Cordy has a mass of 55.0 kg and the coefficient of friction between the box and the snow is 0.05, with what acceleration does Cordy head down the hill? (20)
5. Mark goes sky diving one weekend. He has a mass of 75.0 kg. How much force does his parachute need to provide so that he accelerates downwards at 0.50 m.s^{-2} ? (10)
6. What is magnitude of the acceleration of the box pictured to the left? (20)
7. A system is made of two blocks, masses 1.50 kg and 3.00 kg, connected by a light string. The lighter block is sitting on a horizontal surface with no friction and the other block is hanging off the edge of the surface by the string passing over a light frictionless pulley. What is the acceleration of the system? (30)
8. You, mass 65.0 kg, are in an elevator that is accelerating upwards at 2.33 m/s^2 . You happen to be standing on a scale. What weight does the scale display? (20)
9. You push at an angle of 15.0° to the horizontal down on a 44.0 kg crate with a force 85.0 N. What is the coefficient of friction between the crate and the ground if it moves at a constant rate? (20)
10. Explain why you want anti-lock brakes, brakes that keep the wheels turning, on your car. (10)(RO)



11. What is the force in each of the strings shown in the diagram?
(10)

12. Draw the Free Body Diagrams for the system shown below.
Assume there is friction on all surfaces. Draw Free bodies for each
part of the system and the whole system. M_3 is more massive than
 M_2 . (20)(RO)



13. A box sits on a 43.0° incline. What is the coefficient of friction between the box and the incline for this to be true? (10)

14. You are driving home at 20.0 m/s when you see a branch blocking the road 30.0 m ahead. How much force do your tires need to apply to the road for your 2540 kg car to stop before hitting the branch? (20)