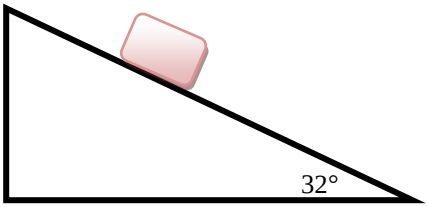
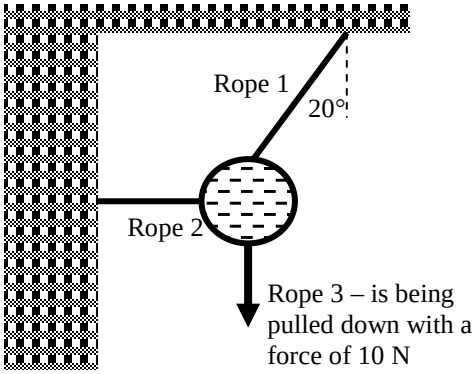
Name _____ Date _____ Period _____

Unit 3 Worksheet 4: More Equilibrium Problems

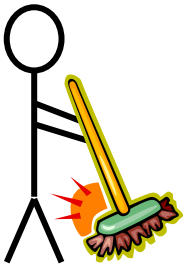
1. (a) What is the mass of the box on the slope assuming it is sliding down the ramp at a constant velocity with a frictional force of 150 N? (b) Assuming the frictional force stays constant, what happens to the motion of the box if the angle is decreased? Justify your answer.



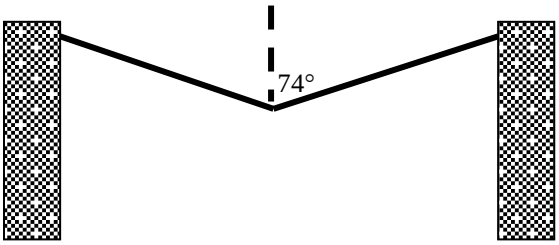
2. A 13 kg object is attached to the 3 ropes as shown below. (a) What is the force in rope 1 & 2? If the angle is increased what happens to the tensions in rope 1 & 2? Justify your answer.



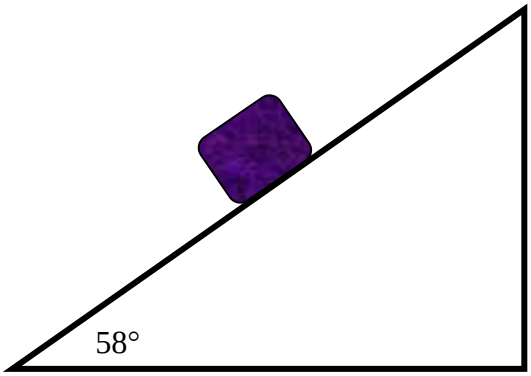
3. A man pushes on a 2.0 kg broom at a constant speed across the floor. The broom makes a 50° angle with the floor. He pushes the broom with a 5.0 N force. (a) What is the normal force applied to the broom and what is the frictional force applied to the broom? (b) How do those forces change if the angle is reduces? Justify your answer.



4. (a) What is the tension in the strings is the cat has a mass of 23 kg? (b) How does the tensions change if the angle is reduced? Justify your answer.



5. The 4.5 N object below is in static equilibrium on the ramp. What is the frictional force that is keeping the object in place? What is the normal force?



6. The hexagon has a weight of 30 N and is attached to the 3 ropes shown below. Rope 1 has a tension of 45 N. What is the angle of rope 3 if it is being pulled down and to the left with a force of 20 N and what is the tension in rope 2?