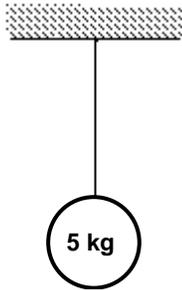Name:_____Period ____Date _____
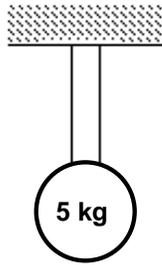
UNIT 3 Worksheet 3 - Force Diagrams & Statics

For each of the problems below, carefully **draw a force diagram of the system** before attempting to solve the problem.

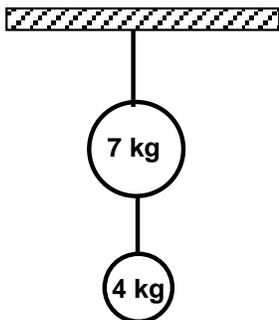1. Determine the tension in each cable in case A and case B.
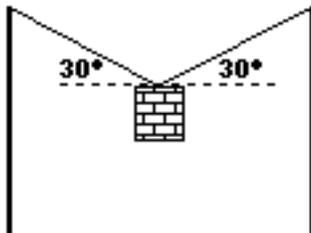
Case A   Case B

5 kg   5 kg

2. Determine tension in each cable. (Hint: There is more than one way to define the system.

7 kg

4 kg

3. If the object hung from the cable has a weight of 25 N, what is the tension in the cable?


30°   30°

Repeat the problem above with a 5° angle. How does the tension compare and make a general statement about how the tension changes when the angle decreases.

4. Analyze the forces acting on the point where the ropes connect and determine the weight of the ball if the system is in equilibrium. The cable at right exerts a 30 N force.
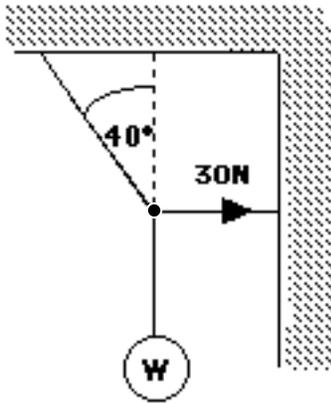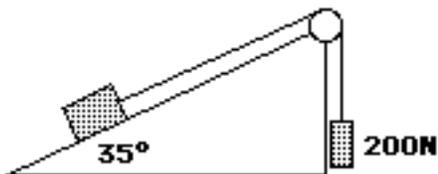

5. The box on the frictionless ramp is held at rest by the tension force. The weight of the box is 100 N. What is the magnitude of the applied force?
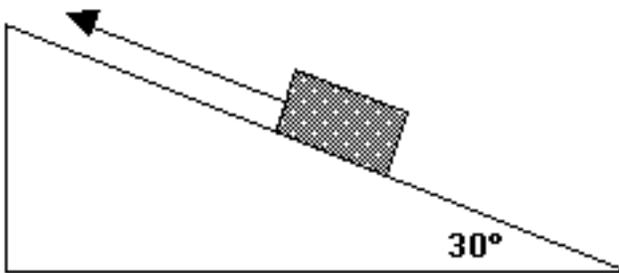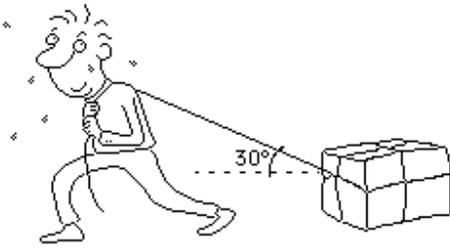

What would be the value of the force if the angle were increased to 45°?

6. In the system below the pulley and ramp are frictionless and the block is in static equilibrium. What is the **mass** of the block on the ramp?

7. A man pulls a 50 kg box *at constant speed* across the floor. He applies a 200 N force at an angle of 30°.

    a.   Write the sum of the forces in the y direction and use it to find the value of the normal force?

    b.   Write the sum of the forces in the x direction and us it to find the value of the frictional force opposing the motion?

8. The system below is at rest. If the ball weighs 8.0 N, what are the tensions in the ropes?