Name_____

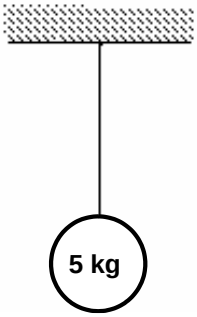
Date _____ **Pd**____

UNIT II: Worksheet 2

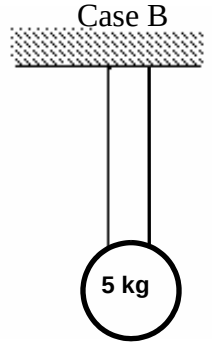
For each of the problems below, carefully draw a force diagram of the system before attempting to solve the problem.

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

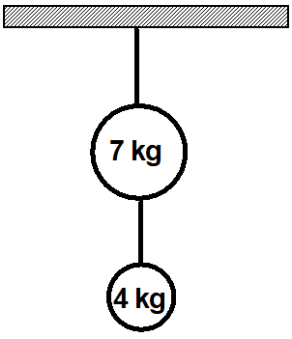
Case A



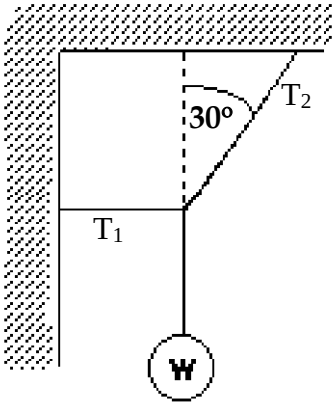
Case B



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



3. The cable at left exerts a 30 N force.



a. Write the equation for the sum of the forces in the x-direction. Solve for the value of T_2.

b. Write the equation for the sum of the forces in the y-direction. Solve for the force of gravity acting on the ball.

4. A man pushes a 2.0 kg broom *at constant speed* across the floor. The broom handle makes a 50° angle with the floor. He pushes the broom with a 5.0 N force.

a. Sum the forces in the y-direction. Solve for the value of the normal force.

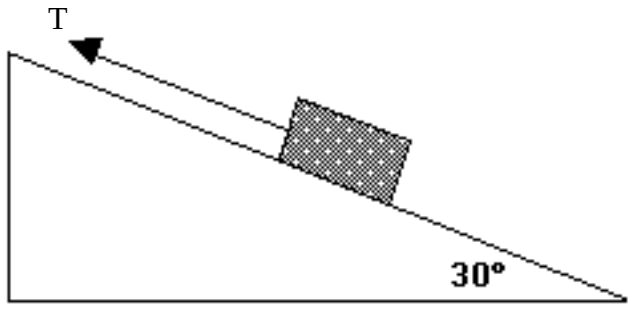
b. Sum of the forces in the x-direction. Solve for the value of the frictional force opposing the motion.

c. If the frictional force were suddenly reduced to zero, explain what would happen to the broom.

For each of the problems below, carefully draw force diagrams with rotated and labeled axes before attempting to solve the problem.

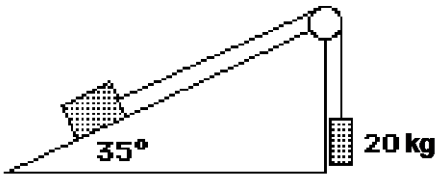
5. The box on the *frictionless* ramp is held at rest by the tension force. The mass of the box is 20 kg.

a. Calculate the value of the tension force.



b. Calculate the value of the normal force.

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



7. The 2 kg block is being pushed by a hand applying a 12 N force, parallel to the surface of the ramp. Calculate the force of friction between the block and the ramp required to keep the block moving at a constant velocity of 2 m/s.