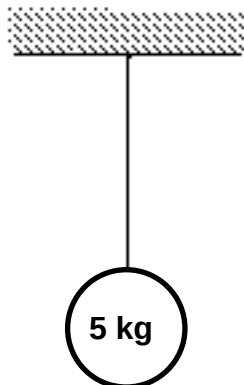


UNIT IV: Worksheet 3

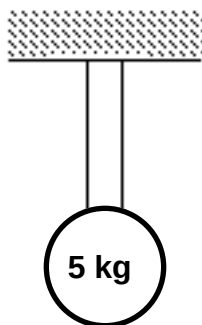
For each of the problems below, carefully draw a force diagram of the system before attempting to solve the problem.

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

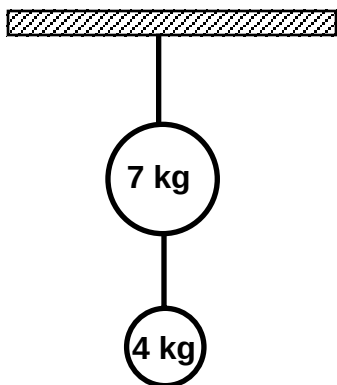
Case A



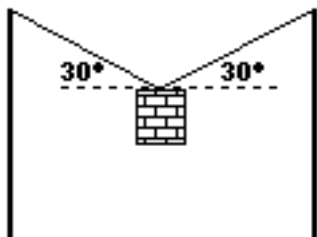
Case B



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

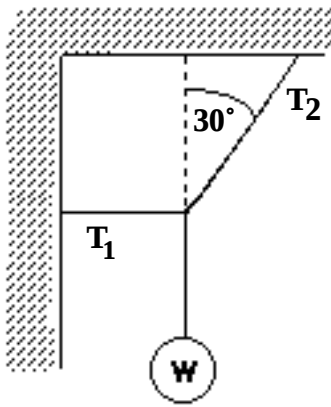


3. The object hung from the cable has a weight of 25 N. Write the equation for the sum of the forces in the y-direction. What is the tension in the cable?



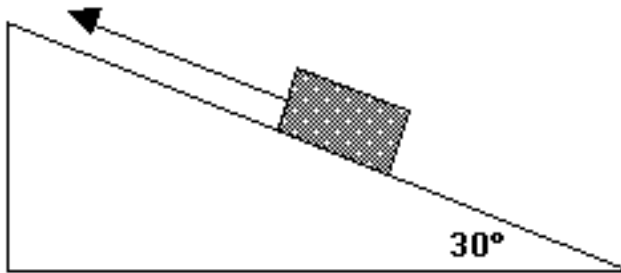
Repeat the problem above with a 53° angle. How does the tension compare?

4. The cable at left exerts a -30 N force.



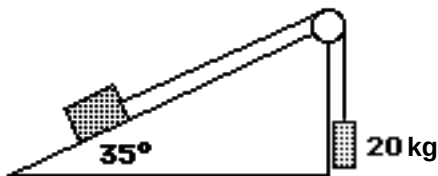
- Write the equation for the sum of the forces in the x-direction. What is the value of T_2 ?
- Write the equation for the sum of the forces in the y-direction. What is the force of gravity acting on the ball?

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

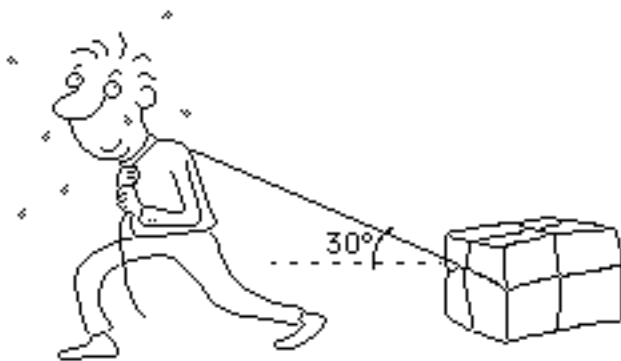


What is the value of the normal force?

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° .



- Sum the forces in the x-direction. What is the value of the frictional force opposing the motion?
- Sum the forces in the y-direction. What is the value of the normal force?

8. 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.



- Sum the forces in the y-direction. What is the value of the normal force?
- Sum of the forces in the x-direction. What is the value of the frictional force opposing the motion?
- If the frictional force were suddenly reduced to zero, what would happen to the broom?