Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Period Date

**PHYSICS UNIT IV Worksheet 3B - Force Diagrams & Statics**

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



b. What is the value of the normal force?

2. A 30 kg box is held in place by a static force of friction on an incline set at 40°. What is the value of that static force of friction?

**30 kg**

40°

3. In the system below the pulley and ramp are in static equilibrium as the block slides down the ramp at constant speed. Given a kinetic frictional force of 20 N, what is the **mass** of the block on the ramp?

20

kg

35°

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

b. Sum the forces in the y-direction. What is the value of the normal force?

5.



A person pushes on a 50 kg desk with a 200N force acting at 30° angle above the horizontal. The desk does not budge.

a. Draw a force diagram for the desk.

b. Determine the x component of the force of tension.

c. Determine the y component of the force of tension.

d. What is the weight of the desk?

1. Write the equation which describes the forces which act in the x-direction.
2. What is the static frictional force on the desk?

g. Write the equation which describes the forces which act in the y-direction.

h. What is the normal force acting on the desk?