## <u>Physics 12 Practice Quiz – Dynamics in 2-D - Dec 2018 (1)</u>

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

A 45.0 kg skier slides down a hill. The hill is inclined at an angle of 18.0° to the horizontal.
a. Draw the free body diagram for the skier.

b. Determine the acceleration of the skier if the coefficient of friction between the snow on the hill and the skis is 0.090

- 2. Carla pushes an 18.0 kg box along a horizontal floor. She pushes with a force of 300.0 N, directed at an angle of 30.0° below the horizontal. The surface of the floor is rough (there is friction)
  - a. Draw the free body diagram for the box.

b. Determine the magnitude of the normal force on the box.

c. Determine the maximum coefficient of friction if the box is sliding along the floor at a constant speed.

- 3. For the pulley system shown:  $m_1 = 0.50 \text{ kg}$ ;  $m_2 = 0.35 \text{ kg}$
- a) Draw the free body diagrams for both masses (include sign convention) *massless, frictionless,*



- b) Determine the acceleration (direction and magnitude) of m<sub>1</sub>.
- c) Determine the magnitude of the tension on the cord.
- 4. For the system shown below:
  - a. Draw the free body diagrams for both masses.



- b. Determine the acceleration of the system if the table surface is greased, making  $\mu \approx 0$ .
- c. Determine the minimum value of  $\mu_s$  that will hold system at rest.
- d. Determine the acceleration of the system if  $\mu_k = 0.156$ .