

Name \_\_\_\_\_

Date \_\_\_\_\_

Period \_\_\_\_\_

**Unit 4**

**Newton's Laws and Forces Practice Test**

**Form P**

1. You and your beloved have just returned to your car after a romantic walk on the beach at sunset. Why is it that stomping your feet on the parking lot's asphalt will get the sand off of your shoes?
  
  
  
  
  
  
  
  
  
  
2. A skater, whose mass is 80.0 kg, slows to a stop from a speed of 4.00 m/s in only 5.00 m.
  - a. What was their deceleration?
  
  
  
  
  
  
  
  
  
  
  - b. How much force, assuming it was constant, was required to stop them?
  
  
  
  
  
  
  
  
  
  
3. Ashley is sitting at her table when Danny walks up and lifts up one end of the table to an angle of  $30^\circ$  to the horizontal. At that moment, Ashley's binder begins to slide at a constant speed of 0.25 m/s. If her binder had a mass of 1.5 kg...
  - a. Draw and label all of the forces acting on the sliding book
  
  
  
  
  
  
  
  
  
  
  - b. Calculate the magnitudes of all of the forces you named in part A.
  
  
  
  
  
  
  
  
  
  
4. A certain force **F** is applied to  $m_1 = 5.0$  kg and produces an acceleration of  $2.4 \text{ m/s}^2$ . When  $m_1$  and  $m_2$  are fastened together and the same force is used, an acceleration of  $1.5 \text{ m/s}^2$  is observed. Find **F** and  $m_2$ .

5. George is pulling horizontally on a rope attached to a heavy 200 kg floor safe with a force of 80.0 N. The safe is moving across the floor at a constant speed of 5.00 m/s.
- Draw and label all of the real forces acting on the floor safe.

- Calculate the net force acting on the floor safe.

Jerry joins George in pulling on the rope with an additional force of 40.0 N.

- What is the new net force on the floor safe?

- What is the acceleration of the floor safe?

- How far will the floor safe move in the 5.00 seconds after Jerry joins George?

6. A block of wood with a mass of 0.500 kg is placed on a board lying on top of a table. When the board is raised to an angle of  $15.0^\circ$  to the horizontal and given a gentle tap, the block slides downward at a constant speed of 0.100 m/s.
- What is the coefficient of kinetic friction?

Now the board is raised to an angle of  $25.0^\circ$  from the horizontal. The block begins to travel with a speed of 1.750 m/s.

- How much time will it take the block to come to rest?

- How far will the block of wood travel?