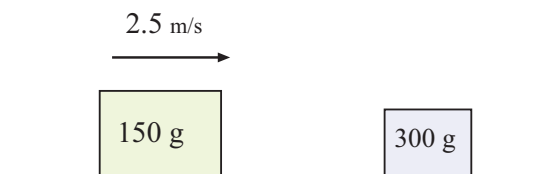


Name \_\_\_\_\_

Phys 2010 (NSCC), Fall 2006  
Problem Set #9

1. A 150.0-g object moving to the right at  $2.5 \frac{\text{m}}{\text{s}}$  collides elastically with a 300.0-g object which is at rest. Find the *velocity* of each object after the collision. (Velocities must have some indication of which direction the object is moving.)



2. What would the final velocities in problem 1 have been if the 300 g had been moving toward the (stationary) 150 g mass at  $2.5 \frac{\text{m}}{\text{s}}$  ?

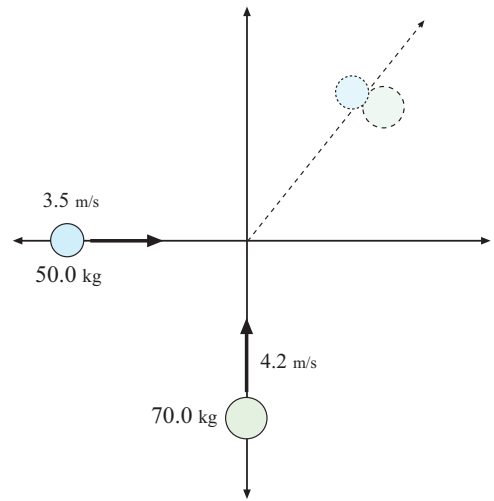
**3.** A 7.0-g bullet is fired into a 1.5-kg ballistic pendulum. The bullet sticks in the block and the block rises to a maximum height of 23 cm.

Using energy conservation, find the speed which the pendulum bob (and embedded bullet) must have had just after the collision.

**4.** In Problem 7, find the initial speed of the bullet.

**5.** On a frictionless surface, a 50.0 kg mass is moving in the  $+x$  direction with a speed of  $3.50 \frac{\text{m}}{\text{s}}$  and a 70.0 kg mass is in the  $+y$  direction with a speed of  $4.20 \frac{\text{m}}{\text{s}}$ ; they collide and stick together.

Find the velocity components ( $v_x$  and  $v_y$ ) of the combined mass after the collision



**6.** In problem 5 find the speed and direction of motion of the combined mass after the collision.

7. Two masses lie on the  $x$  axis: A 5.5 kg mass is at  $x = 1.00$  m and a 8.0 kg mass is at  $x = 5.00$  m.

What is the coordinate of the center mass of this system?



8. Convert 25.6 rad to: (a) Degrees (b) Revolutions.