Name:_____Date:_____Course:_____Professor: _____

# M21a Prelab: Conservation of Momentum

Read lab instructions before answering the questions

1) What does it mean for a quantity such as momentum or kinetic energy to be conserved?

2) In your experiment, you will study a collision using an apparatus called a ballistics pendulum. The collision will be between a horizontally projected ball and a stationary pendulum, which will catch and hold the ball as the collision occurs. If the mass of the ball, $m$, initial velocity of the ball, $v_i$, mass of the pendulum, $M$, angle when the pendulum reaches the highest point, $\theta$ and final velocity of the system after collision, $v_f$, are known:

   a) Write the equations for the total kinetic energy before and after an inelastic collision.

   b) Write the equations for the total momentum before and after an inelastic collision.

3) Max is measuring the momentum before and after an inelastic collision. He launches a ball into a pendulum that has a length R = .627 m and reaches a maximum angle of 27°. If he uses the equation given in the lab instructions to calculate the final velocity of the system, what would this value be?