1. A 2.0-kg block is held in equilibrium on an incline of 35° by a horizontal force, $F$, applied by the hanging mass of 1.0 kg. What is the coefficient of friction ($\mu$)?

2. Find the tension in the two wires that support the 100-N light fixture. Each wire makes a 25° angle from the ceiling.

3. You are in a roller coaster car that has a total mass of 400.0 kg and a velocity of 5.0 m/s at A. It follows the section of track shown below starting at 5.0 meters in the air at A. How high up B will the car go? (Use energy equations.)

4. A light string connects two masses over a light frictionless pulley as in the diagram below. The 5.00-kg mass is 4.00 m above the floor and the 3 kg mass is on the floor.
   a. What is the speed of each mass as they pass each other?
   b. Determine the speed as the 5.00-kg mass hits the floor.
   c. How much higher will the 3.00-kg mass go after the 5.00-kg mass hits the ground?
5. A 15g bullet is shot at 300.0 m/s by a 5.00 kg gun. What is the velocity of the recoil of the gun?

6. How long will it take to stop a $2.0 \times 10^4$-kg train moving at 0.50 m/s, if the average force it applies to the wall below is 8333N?

7. What is the initial momentum of a 500.0 kg bumper car that strikes a glancing blow on a 450.0 kg car? The first car has a final speed of 8.00 m/s at 25° N of E and the second car travels at 10.0 m/s at 30.0° S of E.