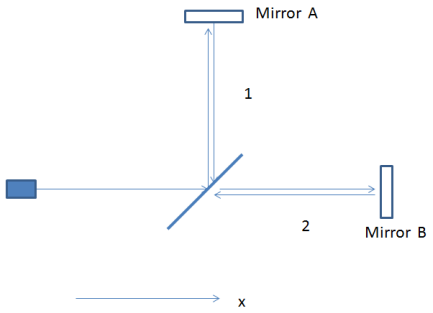
1. Use Lorentz transformation (Do NOT assume time dilation or length contraction), calculate the Michelson-Morley experiment: what is the traveling time of light
   a. From the 45 degree mirror to mirror A
   b. From mirror A back to the 45 degree mirror
   c. From the 45 degree mirror to mirror B
   d. From mirror B back to the 45 degree mirror

   The proper length of each arm (1 and 2) is L.



   <u>Do the calculations both for ground observer and observer moving at speed of V along the x-axis.</u>

2. An electron source is moving in relative to a ground observer at 0.5c, along the x-axis. It emits an electron flying at speed of 0.9c perpendicular to the x-axis (both in relative to the source). What is the speed and direction of the emitted electron observed by the ground observer?

3. An electron has a kinetic energy of 1Mev. What is its momentum?

4. A stationary particle with rest mass M_0 decays into 2 particles with rest mass m_0 and m_1. Write down the equations which allow you to solve for the velocities of the two particles (you don't need to solve the equations). What are the velocities of two particles if m0=m1?

5. A force F pushes a particle alone the direction of its movement. What is the relation between F and the speed and acceleration of the particle?