1. In a lecture in the future, the lecture halls are huge and I can move very rapidly. In fact, in a lecture one day, after the start of the lecture, I moved at a speed of \( \frac{3}{5}c \) back and forth between the walls of the lecture hall as shown in Figure # 1: I am at rest in the middle of the classroom until the start of the lecture. It takes me 10 seconds to reach the first wall. During this period how big is the lecture hall to me? How big did I think that the lecture hall was before the start of the lecture? An instant before the lecture starts, all the students open their notebooks. An instant after the start of the lecture, I note that half the students have not opened their notebooks yet. Which half and why is that? How long after the start of the lecture is it until I return to the wall that I first moved toward the second time that I am there? How long after the start of the lecture do the students say it took for me to get there? During the first 10 seconds of my lecture, I am inertial. Draw what is going on from the perspective of that frame. There are three students that are located in the direction of the first wall from where I start. The first is one lightsecond away, the second is two lightseconds away, and the third is three light seconds away. Right after I get moving, I note that they do not open their notebooks together. What order do I record them as opening their notebooks? How much time do I say that there is between their notebook openings? In the interval after 10 seconds but before the turn around at the other wall, how fast am I moving relative to the wall? A comoving inertial observer with me now notes that the students do not open their notebooks simultaneously but in what order does he say they do it? What is the time separation of the notebook openings now? How fast am I moving relative to my first inertial frame after the start of the lecture? How long does it take me to get to the other wall as measured in this inertial frame?
2. For a very heavy particle, a huge, there in no movement. The propa-
gator which describes how the amplitude develops in time is one over
the mass, i.e. the bare propagator is $\frac{1}{m_0}$. This particle, the huge, is
now placed in a medium in which there are two things that can happen
to it, a dink with weight A and a dank with weight B. What is the
propagator for the huge in the medium? What is the effective mass of
the huge?

3. Do Problem 5.10 in “Travelers Guide”. Add a section. d. Use Fig. 5.7
as shown with the x distance 1 mm = 1 light sec and the t distance
1 mm = 1 sec. Evaluate all three times described in sections a, b, and
c.

4. Do Problem 6.7 in “Travelers Guide”.

5. Do Problem 7.7 in “Travelers Guide”.

6. Do Problem 8.5 in “Travelers Guide”.

7. Do Problem 8.12 in “Travelers Guide”.

8. Do Problem #9.7 in “Traveler’s Guide”.


10. Do Problem #10.6 in “Traveler’s Guide”. Now generalize this result
and obtain a formula that tells you the total mass needed to give a
payload a velocity, $v$.

Home Experiment #11 No home experiment this week. There is enough to
do above