A rocket ship is traveling “north” at 0.5c relative to the earth.

1. 1pt. What is $\beta$ of the rocket ship with respect to earth?

2. 1 pts. What is $\gamma$ of the rocket ship with respect to earth?

A and B are traveling on two trains in opposite directions on close, parallel tracks at high speed. When they are about to pass one another, A and B each lean out of their windows and give a high-five to one another. Because they were at different potential differences, when their hands touch, there is a large spark. The spark causes a pulse of light to emerge from that point, traveling outward.

3. 1pt. In A’s rest frame, she sees the pulse of light develop spherically and hit the front and the back walls of her car simultaneously. What does B see in his frame of reference?
4. 2pts. What does B see the pulse of light do in A’s car?

5. 2pts. Before Einstein, what would L, in his reference frame, have said was the speed with which R is approaching?

6. 3pts. After Einstein, what would L, in his reference frame, have said was the speed with which R is approaching?