1. A train with proper length of 200m is traveling at the speed of 120km/hr. An observer on the ground sees two lightening striking the two ends of the train at exactly the same time. What the time interval of the lightening strikes observed by the observer on the train?

2. What travelling speed is needed to travel to a planet 1000 light years away using only 50 years?

3. Two space ships A (90m long) and B (200m long) travel towards each other. The person in ship A observes that it takes 5x10-7s for the tip of ship B to pass his ship. What's the relative speed of the two ships? How long does a person sitting at the tip of ship B observe for his ship to pass ship A?

4. Prove that wave equation of light is invariant under Lorentz transformation.