

Physics 425, Spring 2012:

Assignment set #13

Due April 11:

33. Griffiths Problem 12.14.

Due April 13:

34. An inertial frame S' moves in the x -direction with speed $v = 0.7c$ in x -direction relative to another frame S . A traveler is moving with velocity $\vec{u}' = 0.5c\hat{x} + 0.5c\hat{y}$ measured in the frame S' .

- (a) what is the traveler's velocity \vec{u} in the frame S ?
- (b) what is the traveler's (4-element) proper velocity η^μ in the frame S' ?
- (c) What is the traveler's proper velocity in the frame S ?
- (d) Show that the proper velocities measured in the two frames are related by Lorentz transformation.

Due April 16:

35. Griffiths Problem 12.28 (b): prove that, if the relativistic momentum is conserved in a reference frame at rest, it is also conserved in an inertial frame moving with a constant velocity v (suppose v is in x -direction).

36. Griffiths Problem 12.35