

CHAPTER OVERVIEW

3: Kinematics

At this stage, many students raise the following questions, which turn out to be related to one another:

1. According to Einstein, if observers A and B aren't at rest relative to each other, then A says B's time is slow, but B says A is the slow one. How can this be? If A says B is slow, shouldn't B say A is fast? After all, if I took a pill that sped up my brain, everyone else would seem slow to me, and I would seem fast to them.
2. Suppose I keep accelerating my spaceship steadily. What happens when I get to the speed of light?
3. In all the diagrams in Section 1.4, the parallelograms have their diagonals stretched and squished by a certain factor, which depends on v . What is the interpretation of this factor?

Topic hierarchy

- 3.1: How can they both . . . ?
- 3.2: The stretch factor is the Doppler shift
- 3.3: Combination of Velocities
- 3.4: No frame of reference moving at c
- 3.5: The Velocity and Acceleration Vectors
- 3.6: Some kinematic identities
- 3.7: The Projection Operator
- 3.8: Faster-than-light frames of reference?
- 3.9: Thickening of a curve
- 3.E: Kinematics (Exercises)

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