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Maggie and Joe are on a ship that moves relative to Liz with speed V . The picture shows the situation from Liz's perspective. All of people have clocks.

Liz measures the times when (1) Maggie passes her (i.e., Liz & Maggie are *colocated*), and when (2) Joe passes her (i.e., Liz & Joe are colocated).

1. Liz's Perspective:

- a) Draw a spacetime diagram for this situation. Label worldlines and important events.
- b) How would Liz calculate (observe) the distance between Maggie and Joe?

2. Maggie & Joe's Perspective:

- a) Draw a picture of the situation from Maggie & Joe's perspective.
- b) Draw a spacetime diagram for this situation from Maggie and Joe's perspective. Label worldlines and important events.
- c) How would Maggie & Joe calculate (observe) the distance between Maggie and Joe?

3. Use your results to find a relation between the distances observed by Liz and by Maggie & Joe.