Warm-Up: Travellers

Prepared by Mark on February 10, 2025

Instructor's Handout

This handout contains solutions and notes.
Recompile without solutions before distributing.

Problem 1:
Four travellers are on a plane, each moving along a straight line at an arbitrary constant speed.
No two of their paths are parallel, and no three intersect at the same point.
We know that traveller A has met travelers B, C, and D,
and that traveller B has met C and D (and A). Show that C and D must also have met.

Solution:

When a body travels at a constant speed, its graph with respect to time is a straight line.
So, we add time axis in the third dimension, perpendicular to our plane.
Naturally, the projection of each of these onto the plane corresponds to a road.
Now, note that two intersecting lines define a plane and use the conditions in the problem to show that no two lines are parallel.