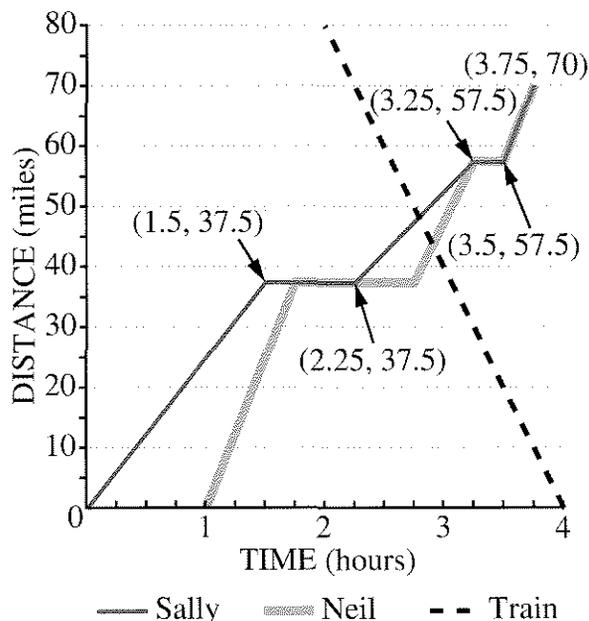


## 4.A The Bicycle Trip

Sally is riding her bike on a trip with her bicycle club. She left the staging area in Chapley at 10 A.M. and took a break at a rest area located about halfway to the final destination of Berkhill, 70 miles away. Neil is driving the sweep vehicle, a van with food, water, first aid, and a bicycle rack. The distance-time graph below shows their progress. There are train tracks along the road. The progress of a train is also shown on the graph.



- Compare Sally's and Neil's progress. Who left first? Where did she or he stop? What happened at the end? What was the total distance covered?
- Including the origin, the coordinates of six points on Sally's graph are given. Describe her ride between consecutive points.
  - At what time did each leg of her trip start and end? How far did she ride each time? How long did it take? How long were her breaks?
  - How fast was she going during each leg of the trip?
- If you were to guess about which part of the trip was downhill or uphill, what would you guess? Why?

- How else might one account for the different speeds?
- How fast did Neil drive in each leg of his trip?
  - Describe the train's progress. Which way was it going? Where and when did it pass Sally and Neil?
  - Where were Sally, Neil, and the train at 12:30 P.M.?
  - At what times were Sally, Neil, and the train 20 miles from the staging area?
  - The equation of the train's motion is  $D = 160 - 40t$ .
    - Choose three points on the train's graph and check that their coordinates satisfy the equation.
    - Do any points in Sally's and Neil's graphs satisfy the train's equation? If so, which ones?

### 9. Summary

- In a distance-time graph, what does it mean if two points are on the same horizontal line? On the same vertical line?
- As you go from left to right on the graph, what is the meaning of a part that goes up? Down? What is the meaning of a horizontal segment? Why is a vertical segment impossible?
- What is the significance of a point that belongs to the motion graphs of two different people?

### 10. Report

Tell the story of the bicycle trip. Use information you gathered from the graph. Make guesses about the trip. Include a graph for Irva, another member of the bicycle club. She too left at 10 A.M. and stopped at the rest area.