

Some Speed problems

John T. Baldwin

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If you want to improve the grade on your assignment you must redo the work correcting the difficulty and answer the two questions posed below. Students with scores below 12 can do the make-up; the maximum score for the repeated work will be 12/15.

MTHT 400 HOMEWORK: Due Sept 7. The problem read:

In each of the following label your variables very carefully and write the solution in a form you would like to read on a blackboard. Write a few sentences of English explanation about how you set the problem up.

1. It takes a bicyclist 4 minutes to ride a mile against the wind and 3 minutes with the wind. How long would it take her to ride a mile with no wind. (Hint: not 3.5 minutes).
2. Joe walks from Jackson south to Taylor on Halsted. At the same time, Hank walks from Taylor north to Jackson on the same sidewalk. Each maintains a steady pace. Joe arrives at Taylor 5 minutes before Hank arrives at Jackson and 4 minutes after the two pass.
 - (a) What is the ratio of their speeds?
 - (b) Would it be possible to actually find the speed of Joe or Hank?
 - (c) Do you know how the length of the trip: in minutes, in feet?
 - (d) If you get any extraneous solutions to equations in the middle of your solution explain how you decide which one to take and why the extraneous solutions arose.
 - (e) (extra credit extension:) Graph these two equations in three variables; Maple would be useful.

Rubric:

The papers were scored as follows:

Problem 1. 2 points for set up and solution; 3 points for clear explanation – possible total of 5. Failure to give units cost 1 point.

Problem 2.

A. Appropriate choice and LABELING of variables 2 points

B. setting up equations 3 points

C. solving equations to get ratio of speeds 1 point

D1. answer to 2b 1 point

D2. answer to 2c 2 points

D3. answer to 2c 1 point

total possible 10 points.

If your score is less than 10 points for the day, you are in trouble in this course.

Further questions:

1. Exactly how many variables and how many equations can you identify in this problem. Try to minimize these numbers by avoiding 'obvious equations'. I.e. we don't really need variable to the time each person takes since if the fast person takes t minutes, the slow takes $t+5$ minutes.

2. Explain what change in your thinking allowed you to solve the problem the second time. Why is the exact definition of the variables essential to figuring out a complicated problem like this?