Proposed Problem

2. It is a beautiful weekend day and, since winter will soon be here, you and four of your friends decide to spend it outdoors. Two of your friends just want to relax while the other two want some exercise. You need some quiet time to study. To satisfy everyone, the group decides to spend the day on the river. Two people will put a canoe in the river and just drift downstream with the 1.5 mile per hour current. The second pair will begin at the same time as the first from 10 miles downstream. They will paddle upstream until the two canoes meet. Since you have been canoeing with these people before, you know that they will have an average velocity of 2.5 miles per hour relative to the shore when they go against this river current. When the two canoes meet, they will come to shore and you should be there to meet them with your van. You decide to go to that spot ahead of time so you can study while you wait for your friends. Where will you wait?

- Create Useful description - sketch, graphs, define quantities, define problem
- Physics Approach - list physics concepts that would apply to this problem
- Specific Application of Physics - use the concepts to model mathematically model the problem
- Mathematical Procedures - use the equations to solve the problem

Aug 5-9:52 AM

Physics Problem Solving Sheet

Useful Description

Picture & Given Information:

$v_A = +1.5 \frac{mi}{h}$

10 mi

$v_B = -2.5 \frac{mi}{h}$

A

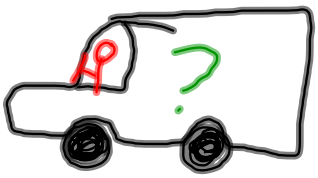
0 mi

B

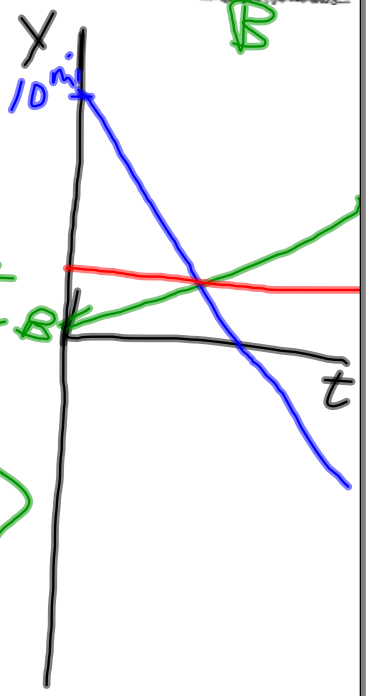
$x_A = 0\ mi$

$x_B = +10\ mi$

$x_{f,A} = x_{f,B} = x_{f,C} = ?$



$\Delta t_A = \Delta t_B$



Question: Where will they meet?

Target Quantiy: x_f

Physics Problem Solving Sheet (cont.)

Physics Approach

Physics Concepts and/or Principles:

Const. velocity

Specific Application of Physics

Assumptions/ Constraints:

no wind resistance / water

Specific Equations:

$V = \frac{\Delta X}{\Delta t}$

$y = mx + b$

Mathematical Procedures

Employ specific equations to solve for target quantity.

$X_A = (1.5\ mi/h)t + 0\ mi$

$X_B = (-2.5\ mi/hr)t + 10\ mi$

$X_C = (0\ mi/h)(t) + ?$

calculator → intersect

$X_f = 3.75\ mi$