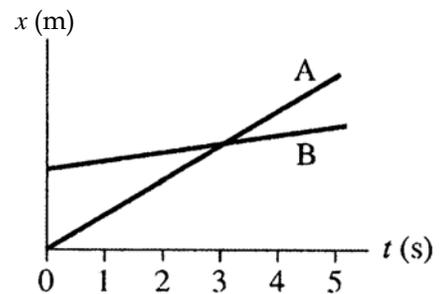# Wednesday Workshop Problems for Solution Posting - Week 3

Goals: all group members should understand problem, solution, and steps in between. Group should collaboratively produce a solution which is clear, complete, and correct, shows all steps/reasoning with all steps valid, and that aims to be a document that someone else can learn from.

a) Your group will be assigned one of the problems below. Work together to make sure that all group members understand the problem and its solution. Use a whiteboard for scratch work and to produce a draft solution. Collaboratively produce a public solution on a (second) whiteboard.
b) Show the solution to an instructor or TA, without explaining it. Get feedback on how solution might be improved. Revise solution based on feedback. Take a picture of the revised solution.
c) Choose a group member to post the solution. Solution must be posted by 11:59 pm tonight. Please follow the detailed instructions from last week's Solution Postings and Reviews Overview (also available at the Week 2 Calendar page). Recall that you individually should aim to post or share posting duties twice this quarter.
d) You are individually responsible for posting a Review to two (2) solutions by 6:00 pm Friday. If your group produced a solution to Problem A, then you will Review solutions to Problem B. If your group produced a solution to Problem B, then you will Review solutions to Problem C. If your group produced a solution to Problem C, then you will Review solutions to Problem A.
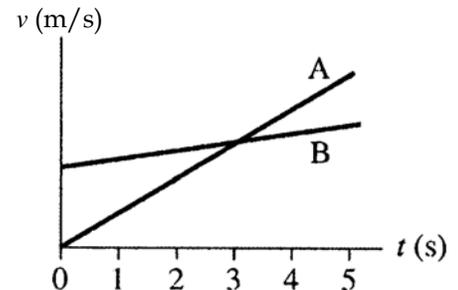
A. based on Quiz 2 #1 & #2 and Quiz 2 #4:

1. The **position vs. time** graphs for two particles A and B traveling in straight lines in the same direction are shown. For each question below, **explain your reasoning**. Your response should address the connections between position, displacement, velocity, and acceleration on a position vs. time graph.
a) At $t = 3$ s, which particle is **further ahead**?
b) Between 0 s and 3 s, which particle **traveled the largest distance**?
c) At $t = 3$ s, which particle has the **larger speed**?
d) At $t = 3$ s, which particle has the **larger acceleration**?

2. The **velocity vs. time** graphs for two particles A and B traveling in straight lines in the same direction are shown. For each question below, **explain your reasoning**. Your response should address the connections between velocity, acceleration, displacement and position on a velocity vs. time graph.
a) At $t = 3$ s, which particle has the **larger speed**?
b) At $t = 3$ s, which particle has the **larger acceleration**?
c) Between 0 s and 3 s, which particle **traveled the largest distance**?
d) At $t = 3$ s, which particle is **further ahead**?

4. An object moving in a straight line with constant acceleration was determined to be moving at 10 m/s at 4 s and at 2 m/s at 8 s.
a) Determine the object's displacement between 4 s and 8 s.
b) Assuming the object was always moving with the same constant acceleration, determine its speed at 0 s.

B. based on Pre-calculus Problem Set 2 #20:

Find the area of the triangle bounded by the y axis, the line $f(x) = 4 - 2x$, and the line perpendicular to $f(x)$ that passes through the origin.

C. based on Physics Problem Set 2 #18:

A bicycle racer is 300 m from the finish line when she begins to sprint. She has an initial velocity of 10.0 m/s and accelerates at the rate of 0.500 m/s^2 for 5.00 s after which she maintains a constant velocity.
a) What is her final velocity?
b) How long did it take her to reach the finish line from the time she began to accelerate?