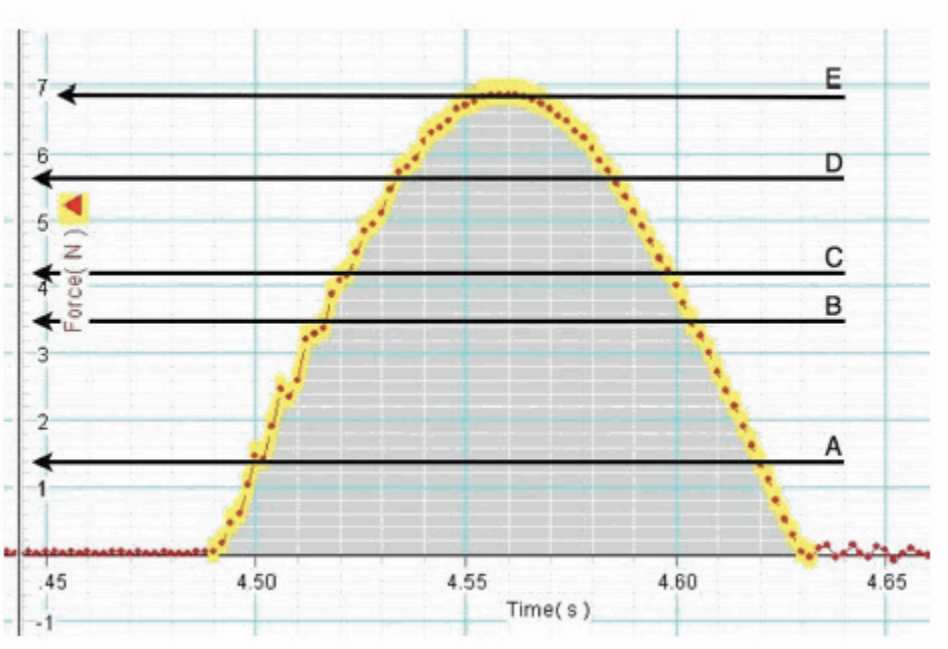
Measuring Impulse and Momentum Change in 1 Dimension

As you work through the steps in the lab procedure, record your experimental values and the results on this worksheet. Use the exact values you record for your data to make later calculations.

Average Force

Why is F_x not constant? Clearly explain your reasoning.

Select the value (A, B, C, D, or E) that your group decided best represents the average force from the sample graph.



Data

Enter your initial time.

Enter your final time.

Enter the momentum of the cart at your initial time.

Enter the momentum of the cart at your final time.

Calculations

Enter your estimate for the average value of $|F_x|$.

The x-component of the force on the cart by the spring is _____.

The x-component of the force on the spring by the cart is _____.

Given your values for initial and final momentum of the cart and the momentum principle, what would you expect the **magnitude** of the area under the F_x vs. t curve to be?

Using your estimate for the average value of $|F_x|$, enter your estimate of the area under the F_x vs. t curve here. (Your answer should be a positive number.)

Enter the area under the F_x vs. t curve as calculated by Capstone.

Upload your graph. (Submit a file with a maximum file size of 200 kB. Make sure that your file is in **.jpg format**. *You will upload this file in the WebAssign question.*)

Analysis

How does the x-component of the net impulse found using $\int F_x dt$ compare to the x-component of the change in the cart's momentum? (Remember that the actual value of the impulse applied to the cart is negative).

When F_x is the biggest it ever gets, what is p_x? Is p_x also at a maximum? Is p_x proportional to F_x? Relate your answers to the Momentum Principle.