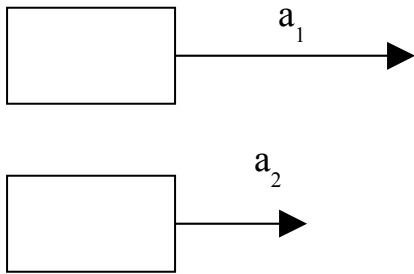


**AP Physics C Lab #2— Relative Motion**

Name \_\_\_\_\_

Grade \_\_\_\_\_



Two cars start from rest from a side by side position and accelerate as shown. Algebraically solve for  $\mathbf{x(t)}$ , a function for the distance between the cars measured in an Earth based frame of reference. Express  $\mathbf{x(t)}$  in terms of  $a_1$ ,  $a_2$ ,  $t$  and any necessary constants. Show your derivation in the space below.

Measure the accelerations of the two cars at your lab table. Make a data table on the back of this sheet to record your experimental results. Write your values for the accelerations on the lines below. Include the absolute error of each acceleration.

 $a_1 =$  \_\_\_\_\_ $a_2 =$  \_\_\_\_\_

Find a solution for the starting positions of the cars  $x_1$  and  $x_2$  (measured from the front edge of the foam) such that when the cars are released they will reach the pulleys at the same time. Include the calculated absolute error for your two positions. Show your work below.