Constant Speed Lab Activity

Name: _____

SPH4C

Lab Partners: _____

_____

_____

Question:

What is the shape of the distance-time graph for a ticker tape pulled through a ticker timer at constant speed?

Hypothesis:

The distance-time graph for a ticker timer pulled through a ticker timer at constant speed will be

_____.

Materials: ticker timer, ticker tape (approximately 1.5 m), carbon disc, metre stick

Procedure:

1. Turn the ticker timer on and pull the tape at as a constant a speed as possible through the timer, taking care not to pull too slowly or too quickly. The dots need to be easily distinguishable.

2. Tear off the beginning and end of the tape, leaving at least 30 dots on your tape.

3. Repeat for each member of your lab group so that each person has their own tape.

4. Mark the first point on your tape with a zero. This point marks the beginning of your time interval, so for this point, time = 0.000 s and distance = 0.0 cm. Measure the distance between this first point and the next point, for which the time elapsed is equal to one period of the ticker timer (1/60 s = 0.017 s). Record this distance and time in the table on the next page.

5. Repeat Step 4 for each of the dots along the length of the tape. Always measure the distance *from the first dot*. (It is a good idea to number each of the points as you go along so you don't lose track of where you are.)

Analysis:

1. Plot a distance-time graph for your data using a separate sheet of graph paper. Time should be on the horizontal axis and distance on the vertical axis. Attach the graph to this page.

2. Draw the line of best fit for your graph and calculate the slope of this line. *Show your work* for the calculation of the slope on your graph.

Data:

Time (s)	Distance (cm)	Time (s)	Distance (cm)	Time (s)	Distance (cm)
0/60 = 0.000	0.0				
1/60 = 0.017					
2/60 = 0.033					
3/60 = 0.050					

Discussion:

1.   What does the slope of your graph represent? _____

2.   Explain why it was important not to pull the tape too quickly.

_____

3.   Explain why it was important not to pull the tape too slowly.

_____

4.   Explain why it was important to exclude the first and last points on the ticker tape.

_____

5.   Another method of finding the distance from the beginning of the ticker tape to a given dot would have been to add up all the spaces between dots. Why would this method produce a larger uncertainty?

_____

_____

Conclusion:

The distance-time graph for a ticker timer pulled through a ticker timer at constant speed is

_____.