**DATA SHEET**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_

15 questions, 2 points, each 30 points total

1. Paste your graphs from Step 1 (Constant Velocity Toward) of the procedure here.

Position

Velocity

Acceleration

1. What is the average velocity that you found in step 1? How does the velocity compare with the slope of the position-time graph?
2. What is the average acceleration that you found in step 1?
3. Paste your graphs from Step 2 (Constant Velocity Away) of the procedure here.

Position

Velocity

Acceleration

1. What is the major difference between the velocity data in Steps 1 and 2?
2. Paste your graphs from Step 3 (Acceleration away) of the procedure here.

Position

Velocity

Acceleration

1. What was the average acceleration that you found from the straight line fit to the velocity?
2. What feature of your velocity graphs signifies that the motion of the cart is away from the sensor?
3. What feature of your velocity graphs signifies that the cart is speeding up?
4. Paste your graphs from Step 4 (Acceleration towards) of the procedure here.

Position

Velocity

Acceleration

1. Paste your graphs from Step 5 (Velocity towards acceleration away) of the procedure here.

Position

Velocity

Acceleration

1. Is there a significant change in the velocity-time graph at the instant of closest approach?

1. Make a straight-line fit of the velocity-time graph. What are the results of your fit?
2. How does the average acceleration (slope) compare to the acceleration found in the previous items?
3. Use the results of all your measurements to fill in the table below. Indicate if the quantities are positive or negative. Use a plus sign (+) if the quantity is positive and a minus sign (-) if it is negative.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Position | Velocity | Acceleration when speeding up | Acceleration when slowing down |
| Cart moving away from sensor |  |  |  |  |
| Cart moving toward sensor |  |  |  |  |