Science 1206
Core Lab #1: Constant Acceleration

STUDENT NAME:_____

DATE:_____

GROUP MEMBERS:

_____ _____

_____ _____

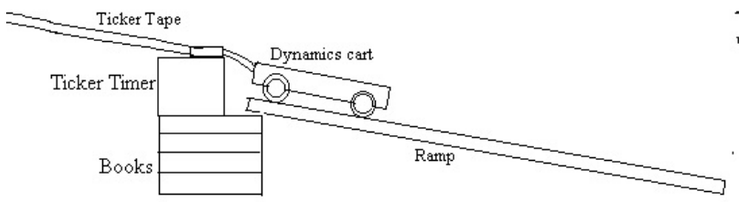
_____ _____

PURPOSE: To analyze the motion of a constantly accelerated object.

MATERIALS:

Ticker Timer (60HZ)
dynamics cart
Carbon disk
Pulley
Ticker tape
Metre stick
Masking Tape

PROCEDURE:



1. Place 4 packages of 8.5 by 14 paper on the desk.

2. Plug the ticker timer in and place a carbon disk on it with the shiny side up.

3. Tape the ticker timer to the end of an incline.

4. Obtain a piece of ticker tape that is shorter than the incline and thread it through the ticker timer so that the tape is on top of the carbon disk.

5. Attach the ticker tape to a cart and position the cart near the ticker timer.

6. ***When you are ready, call your teacher over to inspect your apparatus. If it is correctly set-up, you may then start***.

7. While holding the cart up by the ticker tape, start the ticker timer and immediately afterward let the ticker tape go to allow the cart to move down the incline. As the cart moves along the surface, it will pull the **ticker tape** through the timer leaving a set of "dots" along the backside of the tape. MAKE SURE THERE IS SOMEONE AT THE END OF THE TABLE TO CATCH THE CART. THEY ARE VERY EXPENSIVE!

8. Immediately turn off the ticker timer once the cart reaches the bottom.

9. Obtain the ticker tape from the car.

10. Before allowing the next group to use the equipment, make sure that you can clearly see the dots on your ticker tape. If there is an error; complete another trial.

11. Using masking tape stick the ticker tape to a meter stick and label the first dot with the word “start”.

12. Mark every sixth consecutive dot and label each marked dot as a multiple of 0.10 s

13. Measure the distance from the first dot to each marked dot using a meter stick (you should have two decimal places.)

14. Put the distances in the distance column of the table provided in the data section of this document. **(See Page 2)**

15. Produce a d-t graph. (**See page 3)**

16. Draw a curve of best fit through the points on the d-t graph.

17. Draw a tangent to the graph at 0.10 s.

18. Repeat step 17 for tangents at 0.20s , 0.30s, 0.40 s and 0.50

19. Complete the table for the v-t. **See Page 4**

20. Produce a v-t. graph. **See Page 4**

21. Draw a line of Best fit for the v-t graph

22. Complete Discussion questions

23. Write a awesome conclusion

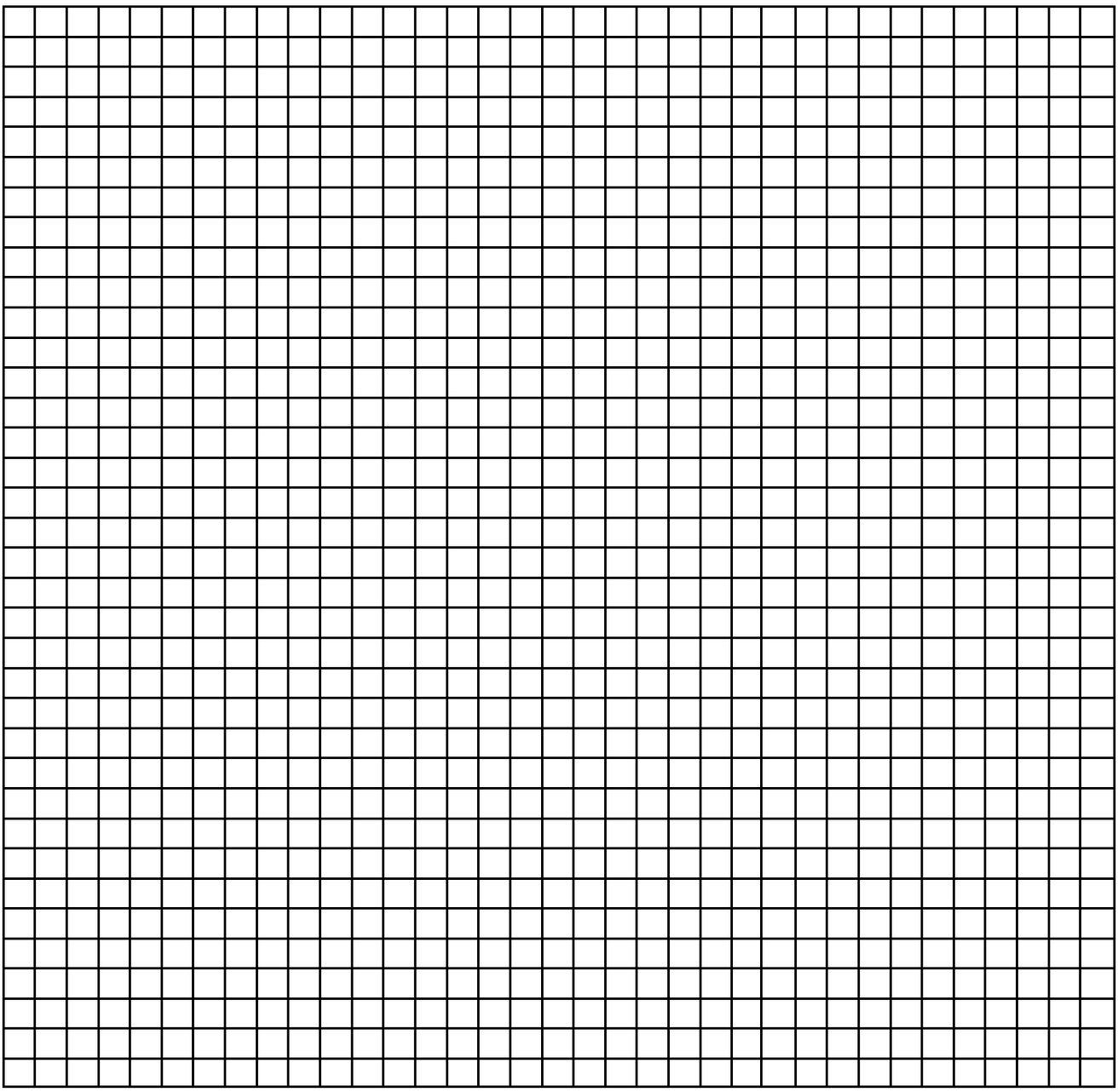
DATA/ CALCULATIONS:

Step 14 **[1]**

t **6 dots = 0.1s**	**d** **(cm)**
0.0	
0.1	
0.2	
0.3	
0.4	
0.5	
0.6	
0.7	
0.8	
0.9	

Step 15 and 16 **[4]**

d-t



Step 17 and 18 : Calculate tangents for the graph above: Show all workings **[4]**

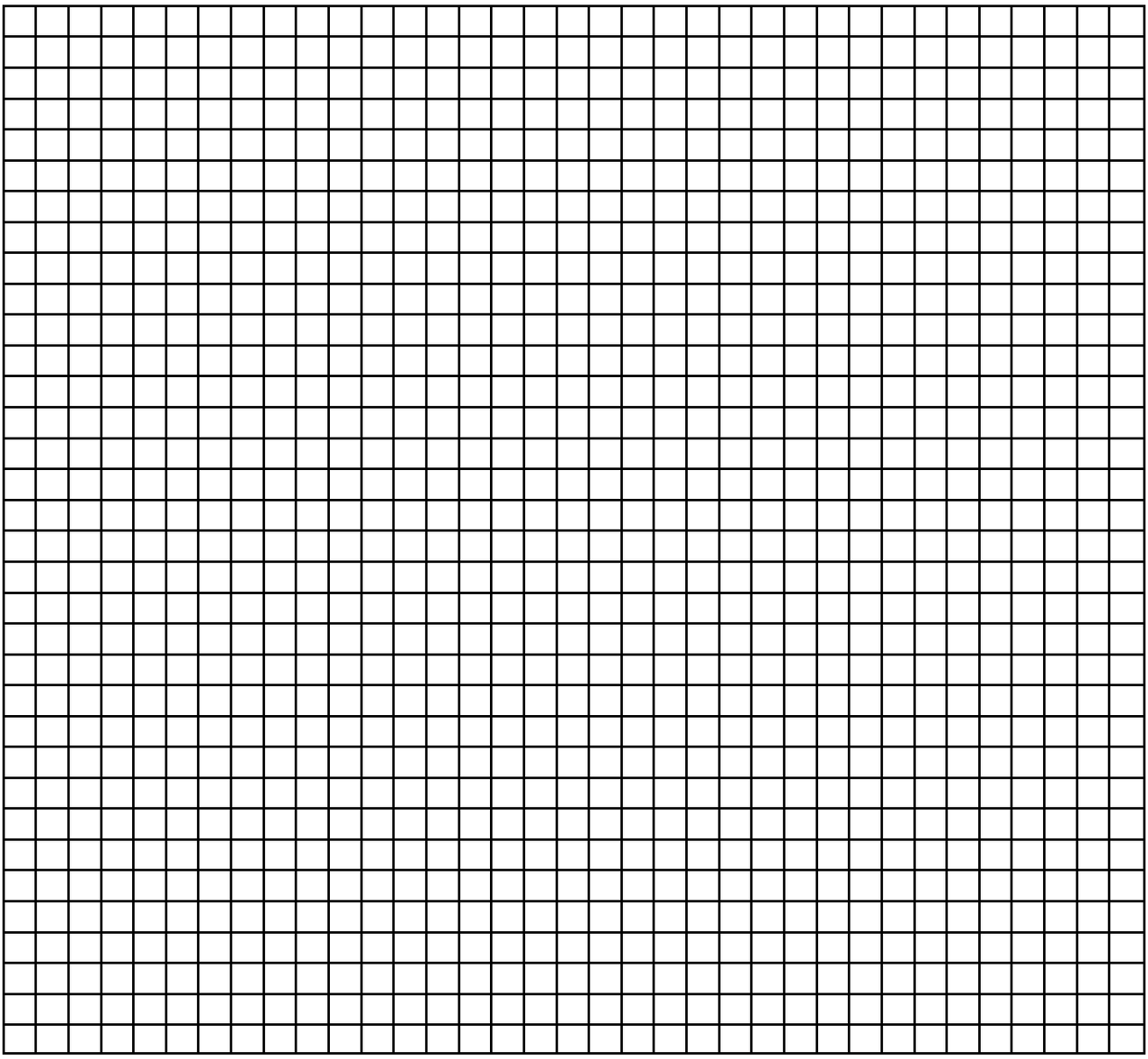
t=0.1 sec	t=0.2 sec	t=0.3 sec	t=0.4 sec	t = 0.5sec

Step 18: **[1]**

t	v
0	0
.1	
.2	
.3	
.4	
.5	

Step 19 and 20 **[4]**

v-t



DISCUSSION:

Displacement vs. Time Graph

1. Describe the shape of the distance vs. time graph for accelerated motion: [1]

2. What does the shape of the graph represent in the real world? [1]

3. What do tangents drawn on the graph represent? [1]

4. What happens to the slope of the tangents as the speed of an object increases? [1]

Velocity vs. Time Graph:

5. Describe the shape of the velocity vs. time graph for accelerated motion: [2]

6. What does the slope of the line represent in the real world? [1]

7. Is the slope of the line constant or does it change? [1]

8. What is the acceleration of the cart? [2]

9. What is the area under the graph from 0 sec to 0.4 sec? [2]

10. What does the area under a v-t graph represent? [1]

CONCLUSION **[20]**