Algebra Hour ____ Name _____

DT Match Lab Activity

For this lab, we are going to analyze the slopes of a graph. Working in groups of three, you will see a graph which is based on distance vs time. You will sketch and study your graph and then walk to match the graph. Put a check mark by each step of the experiment as you complete the step. Answer the specific questions thoroughly. **This lab is worth 30 points and is due at the beginning of class tomorrow.**

Part A: Experiment setup and data collection

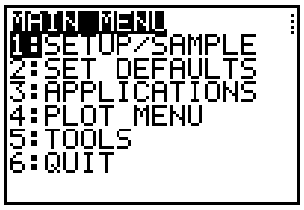
____1) You will need the following materials:

1 graphing calculator
1 CBR

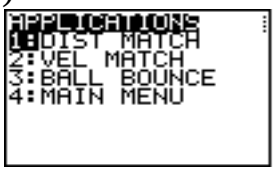
____2) Experiment setup: Connect the CBR to the graphing calculator with a link cord.

____3) You have to run a program to get the data. Press **PRGM** and highlight the program **RANGER.** Press **ENTER** twice.

____4) You should get the screen like the one below on your calculator. It will ask you if you want METERS or FEET. Choose **FEET.**



____5) Press **#3** to **APPLICATIONS**. Press #1 for **DIST MATCH** and press **ENTER**.



____7) You will see a graph appear on the screen. Sketch the graph on the grid provided:

Graph I

Note: Be sure to label the axes and indicate the units of the scales.

____8) Look carefully at the graph. What physical property is represented along the x-axis?_____What are the units? _____ What physical property is represented along the y-axis?_____What are the units? _____

____9) Find the beginning and ending values of x and y where the slope is positive, negative, and horizontal. You will need two points for each part of the graph you see so you can calculate the slope. Indicate the values in the space provided:

Positive Slope: Negative Slope: Horizontal Slope:

Look at your graph and estimate how far from the CBR do you think you should stand to begin walking? _____

Part B: Running the experiment

____10) One person is to hold the calculator and the other holds the CBR while the third person does the walking. Aim the CBR at belt level of the person walking. The person who is walking should position themselves where you think the graph begins. Press **ENTER** to begin data collection. You will hear a clicking sound and see the green light as the data is collected. Walk backward and forward, and try to match the graph. Your position is plotted on the screen.

____11) If you are not happy with your first attempt, press **ENTER,** and select **SAME MATCH.** This will allow you to try it again.

____12) After you have a good graph, press **ENTER** and select **NEW MATCH.** Switch positions and have a different member of the group walk.

____13) Sketch the graph on the grid provided:

Graph II

Note: Be sure to label the axes and indicate the units of the scales.

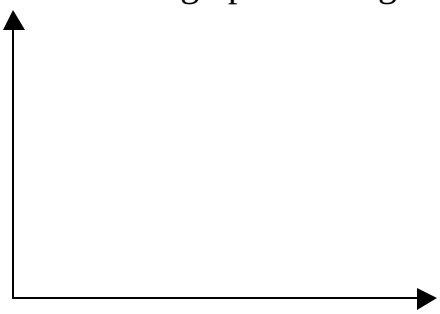
____14) Find the beginning and ending values of x and y where the slope is positive, negative, and horizontal. Indicate the values in the space provided:

Positive Slope: Negative Slope: Horizontal Slope:

Look at your graph and estimate how far from the CBR do you think you should stand to begin walking? _____

____15) Do the walking again until you get a good match and switch positions. Get another graph.

____16) Sketch the graph on the grid provided:



Graph III

Note: Be sure to label the axes and indicate the units of the scales.

____17) Find the beginning and ending values of x and y where the slope is positive, negative, and horizontal. Indicate the values in the space provided:

Positive Slope: Negative Slope: Horizontal Slope:

Look at your graph and estimate how far from the CBR do you think you should stand to begin walking? _____

<u>Part C</u>: Questions: answer the following questions using complete sentences.

1) Find the slope for both the positive and negative lines for all three graphs. Show all work.

Graph I Graph II Graph III

2) When you were walking, what do you do for the segments that were flat?

3) What physical property does the slope, or steepness of the line segment represent?