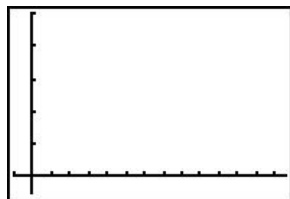




In this adventure, you will observe the effect of two factors on a motion plot. You will walk at two different speeds and walk in two different directions.

1. Sketch the plots of each of the four trials on the axes provided.

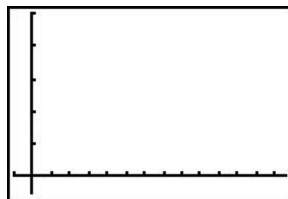
Trial 1



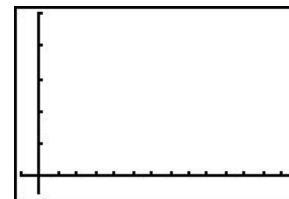
Trial 2



Trial 3



Trial 4



2. Fill in the table below with two coordinates and the slope for each trial.

Trial	Starting Distance	Type of Motion	x-coord. (sec)	y-coord. (m)	Slope (m/s)
1	0.5 m	Slow, steady away from CBR 2	$x_1 =$ $x_2 =$	$y_1 =$ $y_2 =$	
2	0.5 m	Moderate, steady away from CBR 2	$x_1 =$ $x_2 =$	$y_1 =$ $y_2 =$	
3	4.5 m	Slow, steady toward CBR 2	$x_1 =$ $x_2 =$	$y_1 =$ $y_2 =$	
4	4.5 m	Moderate, steady toward CBR 2	$x_1 =$ $x_2 =$	$y_1 =$ $y_2 =$	

3. For Trials 1 and 2, how do the sizes of the slopes compare? How do their signs (positive and negative) compare?

4. For Trials 3 and 4, how do the sizes of the slopes compare? How do their signs compare?

5. How do the slopes from Trials 1 and 2 differ from the slopes for Trials 3 and 4?



6. What effect does changing speed have on the Distance-Time plot?

7. What effect does changing direction have on the plot?

8. Complete the statements to summarize the relationship between motion and the characteristics of the slope value.
 - a. The faster the speed, the _____ the size of the slope.
 - b. Moving away from the CBR 2 makes a plot with a _____ slope, and moving toward the CBR 2 makes a plot with a _____ slope.

Extension

1. Calculate the slope of a line given the two points (1.5, 2.08) and (6, 4.93).

2. Explain why the units of slope in the activity are meters per second (m/s).

3. Would the value of the slope change if the formula was changed to $\frac{y_1 - y_2}{x_1 - x_2}$? Explain why or why not.

4. Suppose motion data were collected for a person standing still, 1 meter in front of the CBR 2. Predict what the Distance-Time plot would look like. Repeat the data collection for this situation. Was your prediction accurate? If not, describe the plot that was made. Calculate and record the slope.

5. Sketch the plot of a walker starting 0.5 meter from the CBR 2 and moving away quickly for a few seconds, stopping for a few seconds, then moving toward the CBR 2 slowly. What is the sign of the slope for each section?

