Match This Motion Lab Report

Physics

This report is an individual assignment. You may hand-write or type it. It should reflect your own thinking and ideas. Points will be awarded for completion and accuracy of selected answers.

Initial Data and Observations

1. Make a sketch of what the distance vs. time graph looked like when you walked away from the motion detector at a constant velocity. (#1)
2. Describe your motion in terms of your position relative to the sensor and the amount of time you spent moving.
3. Make a sketch of what you predicted your distance vs. time graph would look like when you walked faster (and add a corrected graph if your prediction was wrong). (#4)
4. Compare your two graphs by describing the slope of the two lines and comparing a point on one graph to a point on the other graph.

Predictions

5. Describe the motion you predicted for the distance vs. time graph. (#7)
6. Explain how you interpreted the graph in order to determine your predicted motion (for example, how did you use the coordinates of points, and the slope of the lines, to determine how you would need to move?).
7. Describe the motion you predicted for the velocity vs. time graph. (#11)
8. Explain how you interpreted the graph in order to determine your predicted motion.
9. Sketch your prediction of the distance vs. time graph that corresponds to the velocity vs. time graph you matched. (#13)

Results

10. Describe your actual motion that best matched the distance vs. time graph. (#8)
11. Describe your actual motion that best matched the velocity vs. time graph. (#12)
12. Sketch the actual distance vs. time graph that corresponded to the velocity vs. time graph you matched. (#14)

Discussion

13. Clearly explain the following concepts for a distance vs. time graph, *using the correct kinematics terminology*: (#9)
    a. What does the slope tell you about how an object is moving?
    b. What is the difference between a positive, negative, and zero slope?

    c. What two pieces of information do the coordinates of a point convey?
14. Clearly explain the following concepts for a velocity vs. time graph, *using the correct kinematics terminology*: (#15)
    a. What does the slope tell you about how an object is moving?
    b. What is the difference between a positive, negative, and zero slope?
    c. What two pieces of information do the coordinates of a point convey?
15. What does the area between the graph and time axis *between any two coordinates on the graph* tell you about the motion of an object? *Use correct kinematics terminology*. (#16)
16. Explain how you can use a velocity vs. time graph to create a corresponding distance vs. time graph. *What information will you be missing at the conclusion of this process?* (#14)
17. Explain how you can use a distance vs. time graph to create a corresponding velocity vs. time graph. Will you lose any information in making this transformation?