

One Dimensional Kinematics

Pre-Test

1. When using a ticker-tape, why is it that we plot displacement on the vertical (y-axis) axis and time on the horizontal (x-axis) axis?
 - a. We want to see how displacement varies in a given amount of time.
 - b. We want to see how time varies in a given displacement.
 - c. A ticker tape diagram does not provide one with enough information plot a position versus time graph.
 - d. It would not make a difference.
 - e. Not enough information given.
2. Out of all of the physical quantities given below, which does not depend on any other quantity? (This type of quantity is commonly referred to as an independent variable in physics and mathematics)
 - a. Displacement
 - b. Acceleration
 - c. Velocity
 - d. Speed
 - e. Time
 - f. Correct answer not provided
3. We have just found the motion of an object via a ticker-tape diagram. From this data: (1) What is the simplest graph we could plot, (2) If we took the slope of this graph and plotted it against the independent variable in the data, what kind of graph would we have now? **Not clear what data is available, clarify**
 - a. Acceleration-time graph, velocity-time graph.
 - b. Position-time graph, acceleration-time graph.
 - c. Time-position graph, time-velocity graph.
 - d. Position-time graph, Velocity-time graph.
 - e. Time-acceleration graph, time-velocity graph.
4. If the displacement of an object throughout its motion does not change, what can we infer about its velocity and acceleration?
 - a. The object's acceleration is constant.
 - b. The object's acceleration is changing.
 - c. The object's velocity is constant.
 - d. The object's velocity is changing.
 - e. The object's velocity is zero.
 - f. Both **a** and **d**
 - g. Both **b** and **c**

5. If an object were slowing down, how would it look on a position versus time graph?
 - a. Positive linear slope.
 - b. Negative linear slope.
 - c. Positive curved slope.
 - d. Negative curved slope.
 - e. Horizontal directly on the x-axis.
6. What is the purpose of obtaining/constructing position, velocity, and acceleration graphs for objects?
 - a. Graphs let us see how forces act on objects, throughout a given time interval.
 - b. Graphs let us qualitatively describe how the motion of an object varies or does not vary throughout a given time interval.
 - c. Graphs let us see how time depends on the physical quantities: velocity and acceleration.
 - d. None of the above is sufficient.
7. What differences and similarities do you see in each of the applets provided with this unit? What kind of graph are you looking at?
8. Attempt to draw a velocity versus time graph for each one.
9. Will there ever be a time when a displacement vs. time, velocity vs. time, acceleration vs. time graph will look identical for describing the motion of an object (assume it is moving, not stationary)? Explain.

Web Site URL to learn the concepts:

1. <http://www.glenbrook.k12.il.us/gbssci/phys/Class/1DKin/1DKinTOC.htm>
(Access Lessons 1-4)
2. <http://members.xoom.com/Surendranath/CatchUp/CatchUp.html>
3. <http://members.xoom.com/Surendranath/Brake/Brake.html>
4. <http://members.xoom.com/Surendranath/AvoidCrash/AvoidCrash.html>

(Use the above applets to see how graphs of displacement vs. time and velocity vs. time vary when an object is accelerated and/or decelerated.)

Post-Test

1. When using a ticker-tape, why is it that we plot displacement on the vertical (y-axis) axis and time on the horizontal (x-axis) axis?
 - a) We want to see how displacement varies in a given amount of time.
 - b) We want to see how time varies in a given displacement.
 - c) A ticker tape diagram does not provide one with enough information plot a position versus time graph.
 - d) It would not make a difference.
 - e) Not enough information given.

2. Out of all of the physical quantities given below, which does not depend on any other quantity? (This type of quantity is commonly referred to as an independent variable in physics and mathematics)

- a) Displacement
- b) Acceleration
- c) Velocity
- d) Speed
- e) Time
- f) Correct answer not provided

3. We have just found the motion of an object via a ticker-tape diagram. From this data: (1) What is the simplest graph we could plot, (2) If we took the slope of this graph and plotted it against the independent variable in the data, what kind of graph would we have now?

- a) Acceleration-time graph, velocity-time graph.
- b) Position-time graph, acceleration-time graph.
- c) Time-position graph, time-velocity graph.
- d) Position-time graph, Velocity-time graph.
- e) Time-acceleration graph, time-velocity graph.

4. If the displacement of an object throughout its motion does not change, what can we infer about its velocity and acceleration?

- a) The object's acceleration is constant.
- b) The object's acceleration is changing.
- c) The object's velocity is constant.
- d) The object's velocity is changing.
- e) The object's velocity is zero.
- f) Both **a** and **d**
- g) Both **b** and **c**

5. If an object were slowing down, how would it look on a position versus time graph?

- a) Positive linear slope.
- b) Negative linear slope.
- c) Positive curved slope.
- d) Negative curved slope.
- e) Horizontal directly on the x-axis.

6. What is the purpose of obtaining/constructing position, velocity, and acceleration graphs for objects?

- a) Graphs let us see how forces act on objects, throughout a given time interval.
- b) Graphs let us qualitatively describe how the motion of an object varies or does not vary throughout a given time interval.

- c) Graphs let us see how time depends on the physical quantities: velocity and acceleration.
- d) None of the above is sufficient.

7. What differences and similarities do you see in each of the applets provided with this unit? What kind of graph are you looking at?

8. Attempt to draw a velocity versus time graph for each one.

9. Will there ever be a time when a displacement vs. time, velocity vs. time, acceleration vs. time graph will look identical for describing the motion of an object (assume it is moving, not stationary)? Explain.