

Name: _____

Period: _____

Chapter 3 Study Guide

Fill in the blanks as you study the chapter.

3.1 How Far and How Fast?

Position and Distance

An object's _____ can be described in terms of its relationship to a reference point. Choosing a reference point establishes a(n) _____ reference. Describing distance does not need a(n) _____ reference. Distance involves only a measurement of _____, and is a(n) _____ quantity. Position involves both _____ and _____, and is a(n) _____ quantity.

Average Velocity

If an object is moving, its position at one and only one time is a(n) _____ position. The change in _____ of an object is its displacement, which is a(n) _____ quantity. The average velocity of an object is the change in _____ divided by the _____ over which the change occurred. Average velocity is calculated using the equation _____. In this equation, _____, which is read as "delta d," stands for _____. The symbol _____, which is read as "delta t," stands for _____. Average velocity is expressed in a unit made up of a(n) _____ unit divided by a(n) _____. Different units used to describe average velocity can be changed from one to another by the use of _____ factors.

Finding Displacement from Velocity and Time

Displacement can be calculated by using the equation _____. In this equation, _____ represents average velocity and _____ represents the time interval. If the average velocity of an object is the same at all _____, the object is described as moving at constant, or _____, velocity. Constant velocity can be calculated using the equation _____.

Position-Time Graphs

A position-time graph is used to show how _____ depends on _____. If the motion is constant, the data produce a(n) _____ line, which means that the relationship between time and position is _____.

The Slope of a Position-Time Graph

On a position-time graph, the displacement is the _____ separation of two points. The time interval is the _____ separation. The slope of the line is the ratio of the _____ to the _____. The _____ of the line represents displacement. The _____ of the line represents the time interval. The slope of the line represents the _____ of the object.

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3.2 New Meanings for Old Words

Positive and Negative Velocities

Displacements can be _____ or _____, but time intervals are always _____. Displacements to the _____ of the reference point are positive. Displacements to the _____ of the reference point are negative. Speed is the _____ of velocity. Speed is generally shown as positive, but velocity can be _____ or _____.

Instantaneous Velocity

If the motion is not constant, the position-time graph does not produce a(n) _____ line. A straight line can be drawn _____ to the curve at any one point. The _____ of this line is the instantaneous velocity at that point.

Velocity –Time Graphs

If the velocity-time graph, _____ is shown on the horizontal axis and _____ is shown on the vertical axis. If velocity is constant, the velocity-time graph produces a(n) _____ line that is _____ to the horizontal axis. If velocity is increasing, the line has a(n) _____ slope. If velocity is decreasing, the line has a(n) _____ slope. The _____ value of any point on the line is the instantaneous velocity at the time. The area under the line on a velocity-time graph is equal to the _____ of the object from its original _____ to its _____ at a given time.

Relativity of Velocity

Measurements of _____ or _____ depend on the observer's frame of reference. If a person walks slowly toward the back of a moving train, an observer on the train would say that velocity and displacement are _____. An observer standing on the station platform would say that the walker's velocity and displacement are _____. However, when velocities approach the _____, the frame of reference does not matter, and the velocity is _____. This concept is part of _____ theory of relativity.