Concept Items

3.1 Acceleration 1.

How can you use the definition of acceleration to explain the units in which acceleration is measured?

a. Acceleration is the rate of change of velocity. Therefore, its unit is m/s^2.
b. Acceleration is the rate of change of displacement. Therefore, its unit is m/s.
c. Acceleration is the rate of change of velocity. Therefore, its unit is m^2/s.
d. Acceleration is the rate of change of displacement. Therefore, its unit is m^2/s.

2.

What are the SI units of acceleration?

a. \text{m}^2\text{/s}
b. \text{cm}^2\text{/s}
c. \text{m/s}^2
d. \text{cm/s}^2

3.

Which of the following statements explains why a racecar going around a curve is accelerating, even if the speed is constant?

a. The car is accelerating because the magnitude as well as the direction of velocity is changing.
b. The car is accelerating because the magnitude of velocity is changing.
c. The car is accelerating because the direction of velocity is changing.
d. The car is accelerating because neither the magnitude nor the direction of velocity is changing.

3.2 Representing Acceleration with Equations and Graphs 4.

A student calculated the final velocity of a train that decelerated from 30.5 m/s and got an answer of -43.34 m/s. Which of the following might indicate that he made a mistake in his calculation?

a. The sign of the final velocity is wrong.
b. The magnitude of the answer is too small.
c. There are too few significant digits in the answer.
d. The units in the initial velocity are incorrect.

5.

Create your own kinematics problem. Then, create a flow chart showing the steps someone would need to take to solve the problem.

a. Acceleration

b. Distance
c. Displacement
d. Force

6.

Which kinematic equation would you use to find the velocity of a skydiver 2.0\,\text{s} after she jumps from a plane and before she opens her parachute? Assume the positive direction is downward.

a. v = v_0 + at
b. v = v_0 - at
c. v^2 = {v_0}^2 + at
d. v^2 = {v_0}^2 - at