

Quiz #2: Motion in One Dimension

Problem 1 (2 points)

A rock is thrown vertically upward from the surface of the earth. The rock rises to some maximum height and then falls back towards the surface of the earth. Which of the following statements is true?

- a) As the ball rises, its acceleration vector points upward.
- b) The acceleration of the ball is zero when the ball is at its highest point.
- c) The speed of the ball is negative while the ball falls back toward the earth.
- d) The velocity and acceleration of the ball always point in the same direction.
- e) None of the above.

Problem 2 (3 points)

The velocity-versus-time graph for an object moving along an x-axis is shown below. The initial position of the object at $t = 0$ s is $x_i = -10.0$ m.



What are the position, velocity, and acceleration of the object at $t = 3$ s? You must show all of your work to get full credit.

Problem 3 (5 points)

Starting from rest, a race car accelerates at $+7.25 \text{ m/s}^2$ for a distance of 375 m. The driver then hits the brakes and the race car slows down at a rate of -3.50 m/s^2 . (a) How long does it take for the race car to come to rest once the brakes are applied? (b) How far does the car travel once the brakes are applied?