

**HW due 1/24****Due: 11:59pm on Sunday, January 24, 2016**You will receive no credit for items you complete after the assignment is due. [Grading Policy](#)**Exercise 2.7**

A car is stopped at a traffic light. It then travels along a straight road so that its distance from the light is given by  $x(t) = bt^2 - ct^3$ , where  $b = 2.30 \text{ m/s}^2$  and  $c = 0.130 \text{ m/s}^3$ .

**Part A**Calculate the average velocity of the car for the time interval  $t = 0$  to  $t = 10.0 \text{ s}$ .

ANSWER:

$$v_{\text{av}} = 10.0 \text{ m/s}$$

**Correct****Part B**Calculate the instantaneous velocity of the car at  $t = 0$ .

ANSWER:

$$v = 0 \text{ m/s}$$

**Correct****Part C**Calculate the instantaneous velocity of the car at  $t = 5.00 \text{ s}$ .

ANSWER:

$$v = 13.3 \text{ m/s}$$

**Correct****Part D**Calculate the instantaneous velocity of the car at  $t = 10.0 \text{ s}$ .

ANSWER:

$$v = 7.00 \text{ m/s}$$

**Correct**

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**Part E**

How long after starting from rest is the car again at rest?

ANSWER:

$$t = 11.8 \text{ s}$$

**Correct**

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**Exercise 2.21**

The fastest measured pitched baseball left the pitcher's hand at a speed of  $46.0 \text{ m/s}$ . If the pitcher was in contact with the ball over a distance of  $1.50 \text{ m}$  and produced constant acceleration, (a) what acceleration did he give the ball, and (b) how much time did it take him to pitch it?

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**Part A**

ANSWER:

$$a_x = 705 \text{ m/s}^2$$

**Correct**

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**Part B**

ANSWER:

$$t = 6.52 \times 10^{-2} \text{ s}$$

**Correct**

## Exercise 2.51

A rocket starts from rest and moves upward from the surface of the earth. For the first 10 s of its motion, the vertical acceleration of the rocket is given by  $a_y = (2.70 \text{ m/s}^3)t$ , where the  $+y$ -direction is upward.

### Part A

What is the height of the rocket above the surface of the earth at  $t = 10 \text{ s}$  ?

**Express your answer with the appropriate units.**

ANSWER:

$$h = 450 \text{ m}$$

**Correct**

### Part B

What is the speed of the rocket when it is 350 m above the surface of the earth?

**Express your answer with the appropriate units.**

ANSWER:

$$v_y = 114 \frac{\text{m}}{\text{s}}$$

**Correct**

### Score Summary:

Your score on this assignment is 100%.

You received 15 out of a possible total of 15 points.