

Classroom Voting Questions: Calculus II

Section 5.3 The Fundamental Theorem and Interpretations

1. On what interval is the average value of $\sin x$ the smallest?
 - (a) $0 \leq x \leq \frac{\pi}{2}$
 - (b) $\frac{\pi}{2} \leq x \leq \frac{3\pi}{2}$
 - (c) $0 \leq x \leq \pi$
 - (d) $0 \leq x \leq \frac{3\pi}{2}$

2. Water is pouring out of a pipe at the rate of $f(t)$ gallons/minute. You collect the water that flows from the pipe between $t = 2$ minutes and $t = 4$ minutes. The amount of water you collect can be represented by:
 - (a) $\int_2^4 f(t)dt$
 - (b) $f(4) - f(2)$
 - (c) $(4 - 2)f(4)$
 - (d) the average of $f(4)$ and $f(2)$ times the amount of time that elapsed

3. If $f(t)$ is measured in gallons/minute and t is measured in minutes, what are the units of $\int_2^4 f(t)dt$?
 - (a) gallons/minute
 - (b) gallons
 - (c) minutes
 - (d) gallons/minute/minute

4. A bicyclist starts from home and rides back and forth along a straight east/west highway. Her velocity is as shown in the graph, where positive velocities indicate travel toward the east, and negative velocities indicate travel toward the west. On what time intervals is she stopped?

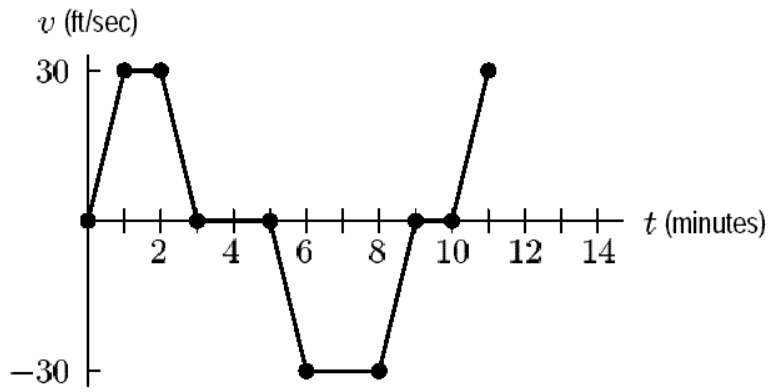


Figure 5.6

- (a) $[1, 2]$, $[3, 5]$, $[6, 8]$, and $[9, 10]$
- (b) $[3, 5]$ and $[9, 10]$

5. A bicyclist starts from home and rides back and forth along a straight east/west highway. Her velocity is as shown in the graph, where positive velocities indicate travel toward the east, and negative velocities indicate travel toward the west. How far from home is she the first time she stops, and in what direction?

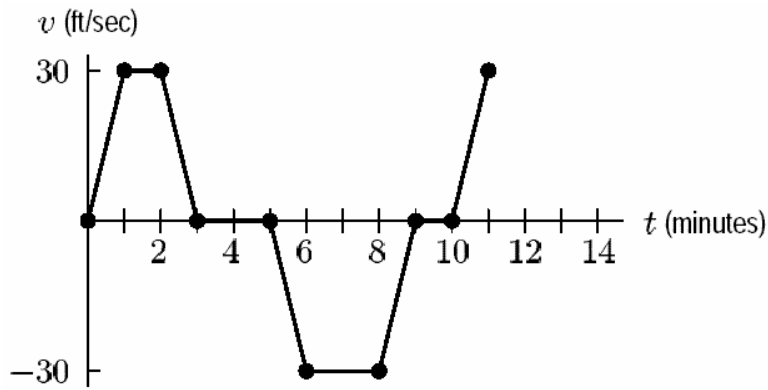


Figure 5.6

- (a) 3 feet east
- (b) 3 feet west
- (c) 60 feet east
- (d) 60 feet west
- (e) 90 feet east
- (f) 90 feet west
- (g) 3600 feet east
- (h) 3600 feet west

6. A bicyclist starts from home and rides back and forth along a straight east/west highway. Her velocity is as shown in the graph, where positive velocities indicate travel toward the east, and negative velocities indicate travel toward the west. At what time does she bike past her house?

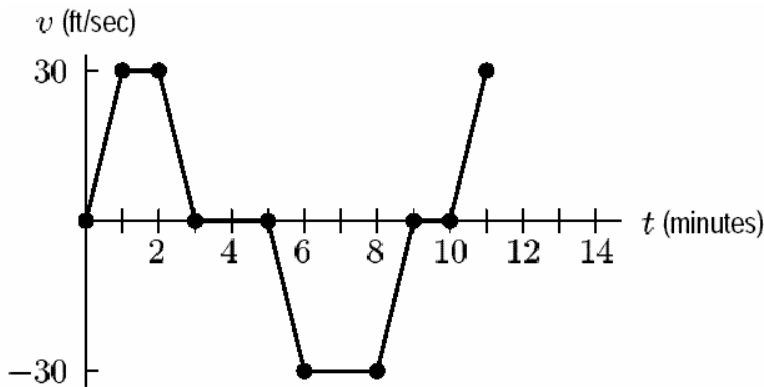


Figure 5.6

- (a) 3 minutes
 (b) 7.5 minutes
 (c) 9 minutes
 (d) never
7. A bicyclist starts from home and rides back and forth along a straight east/west highway. Her velocity as a function of time is given by $v(t)$. What does $\int_0^{11} v(t)dt$ represent?
- (a) The total distance the bicyclist rode in eleven minutes
 (b) The bicyclist's average velocity over eleven minutes
 (c) The bicyclist's distance from the home after eleven minutes
 (d) None of the above
8. A bicyclist starts from home and rides back and forth along a straight east/west highway. Her velocity as a function of time is given by $v(t)$. What does $\int_0^{11} |v(t)|dt$ represent?
- (a) The total distance the bicyclist rode in eleven minutes
 (b) The bicyclist's average velocity over eleven minutes
 (c) The bicyclist's distance from the home after eleven minutes
 (d) None of the above.

9. A bicyclist starts from home and rides back and forth along a straight east/west highway. Her velocity as a function of time is given by $v(t)$. What does $\frac{1}{11} \int_0^{11} v(t) dt$ represent?
- (a) The total distance the bicyclist rode in eleven minutes
 - (b) The bicyclist's average velocity over eleven minutes
 - (c) The bicyclist's distance from the home after eleven minutes
 - (d) None of the above.