

AP Calculus

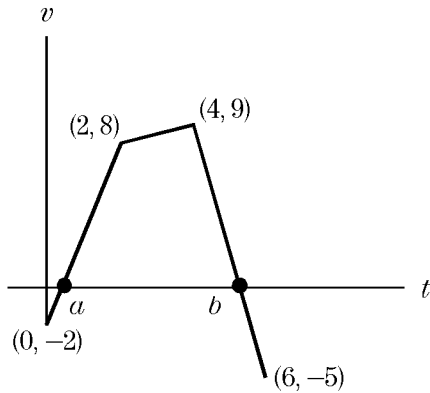
Rectilinear Motion Homework Problems

Name _____

Date _____

1. The graph shows the velocity of an object that is moving along a straight line for t on $[0, 6]$.

At what time(s) t does the object reverse direction?

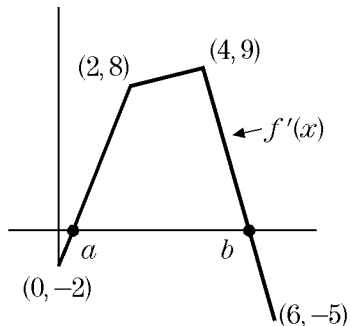


- a) 2 and 4 b) a and b c) 4 only
 d) 5 only e) a only

2. The graph shows the velocity of a ladybug that is moving along a straight line for t on $[0, 6]$.

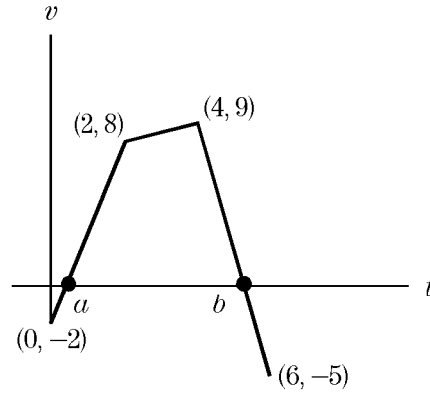
What is the maximum speed of the object?

- a) 6 units/sec
 b) 4 units/sec
 c) 9 units/sec
 d) 5 units/sec
 e) 8 units/sec



3. The graph shows the velocity of a bumper car that is moving along a straight line for t on $[0, 6]$.

When is the acceleration of the object positive?



- a) (a, b) b) $(0, 4)$
 c) $(0, 2)$ and $(2, 4)$ d) $(0, 2)$
 e) $(b, 6)$

4. The graph shows the velocity of Elvis' hound dog that is moving along a straight line for t on $[0, 6]$.

On the interval $(0, 6)$, when is the acceleration of the object undefined?

- a) at $t = 2, 4$ b) at $t = a, b$
 c) at $t = 2, 4$ d) at $t = 2$ only
 e) at $t = a$ only

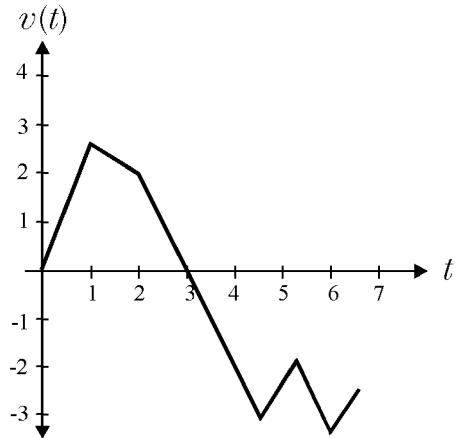
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5. The graph shows the velocity of a kid in a candy store aisle for t on $[0, 6]$.

The object is furthest to the right when $t =$ _____.



- a) 1 b) 3 c) 4 d) 6 e) 7

6. A mouse is running through a straight pipe. The velocity, $v(t)$, of the mouse is given at time t for $0 \leq t \leq 7$.

According to the graph, at what time t does the mouse change direction?

- a) 1 b) 3 c) 4 d) 5 e) 6

7. The position of a particle at any time t is given by $s = t^3 - 15t^2 + 48t - 10$. What is the velocity after 10 seconds?

- a) 30 b) 46 c) 48 d) -16 e) -30

8. The altitude of a glider plane taking off from the edge of a cliff is described by $s(t) = 4t^3 - 5t^2$, $t \geq 0$, where t is in seconds and the altitude above the edge of the cliff is in meters. Find the average velocity in the third second.

- a) 19 m/s b) 38 m/s c) 48 m/s
d) 51 m/s e) 78 m/s

9. The position of a soldier on sentry duty at any time t for $-5 \leq t \leq 5$ is given by $s = t^3 - \frac{9}{2}t^2 - 12t + 4$. When does $v = 0$?

- a) -4, 1 b) 1.5 c) 4, -1
d) 4 only e) 1 only

10. A sly fox starts at time $t = 0$ and moves along a path that can be related to the x -axis so that its position at any time $t \geq 0$ is $x(t) = t^3 - \frac{21}{2}t^2 + 30t - 8$. During what time interval is the fox moving to the left?

- a) $0 < t < 2$ b) $1 < t < 5$ c) $2 < t < 5$
d) $t < 1$ e) $t > 5$

11. The position of a particle moving in a straight line at any time t is $x(t) = 2t^2 + 6t + 5$. What is the acceleration of the particle at $t = 3$?

- a) 24 b) 12 c) 3 d) 4 e) 0

1.
Answer: b
CodePath: EAS.APC.E.I.1
2.
Answer: c
CodePath: EAS.APC.E.I.3
3.
Answer: c
CodePath: EAS.APC.E.I.5
4.
Answer: c
CodePath: EAS.APC.E.I.7
5.
Answer: b
CodePath: EAS.APC.E.I.12
6.
Answer: b
CodePath: EAS.APC.E.I.13
7.
Answer: c
CodePath: EAS.APC.E.I.20
8.
Answer: d
CodePath: EAS.APC.E.I.21
9.
Answer: d
CodePath: EAS.APC.E.I.25
10.
Answer: c
CodePath: EAS.APC.E.I.30
11.
Answer: d
CodePath: EAS.APC.E.I.40