

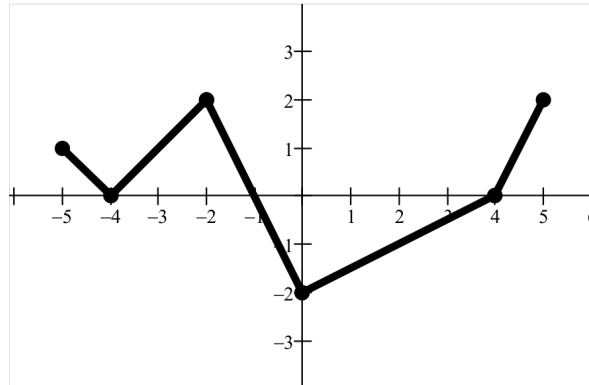


Name: _____ Date: _____ Score: _____

Use the graph of $v(t)$ to answer each question about the particle's motion. Show all work.

Calculus Worksheet # 78
Particle Problem

Given: Graph of $v(t)$ $\{-5 \leq t \leq 5\}$ and $s(0) = 4$



1. $v(2) =$ _____
2. $a(2) =$ _____
3. Given $s(0) = 4$, find $s(2)$ _____
4. When does particle move to the right? _____
5. When does particle move to the left? _____
6. How many times does the particle change direction? _____
7. When does the particle speed up? _____
8. When does the particle slow down? _____
9. When is the particle at rest for an instant? _____
10. When is the particle at rest for more than an instant? _____
11. When is acceleration positive? _____
12. When is acceleration negative? _____
13. When is acceleration zero? _____
14. How much is the maximum acceleration? _____
15. What is the **total distance** traveled by the particle in the 10 second interval? _____
16. When is the particle farthest to the right? _____
17. Given $s(0) = 4$, how far to the right [maximum] does it go? _____
18. Given $s(0) = 4$, At what (if any) time(s) does $s(t) = 0$? _____
19. Find the **average acceleration** of the particle from $-5 \leq t \leq 5$ seconds. _____
20. Find the **average velocity** of the particle from $-5 \leq t \leq 5$ seconds. _____
21. Find the **average position** of the particle from $-5 \leq t \leq 5$ seconds. _____



Answer key — for instructor use only.

Calculus Worksheet # 78
Particle Problem

Answers:

| | |
|-----------------------------|---|
| 1. -1 | 12. $(-5, -4)(-2, 0)$ |
| 2. $\frac{1}{2}$ | 13. never |
| 3. 1 | 14. 2 |
| 4. $(-5, -4)(-4, -1)(4, 5)$ | 15. $\frac{19}{2}$ |
| 5. $(-1, 4)$ | 16. -1 |
| 6. 2 | 17. 5 |
| 7. $(-4, -2)(-1, 0)(4, 5)$ | 18. 4 |
| 8. $(-5, -4)(-2, -1)(0, 4)$ | 19. $\frac{v(5) - v(-5)}{5 - (-5)} = \frac{2 - 1}{10} = \frac{1}{10}$ |
| 9. -4, -1, 4 | 20. $\frac{1}{10} \left[\frac{1}{2} + 3 - 5 + 1 \right] = \frac{-1}{20}$ |
| 10. never | 21. $\frac{1}{10} \left[\frac{7}{4} + 5 + \frac{25}{2} + \frac{1}{2} \right] = \frac{79}{40}$ See graph of $s(t)$ below ↓ |
| 11. $(-4, -2)(0, 4)(4, 5)$ | <p style="text-align: center;">GRAPH OF $s(t)$</p> |