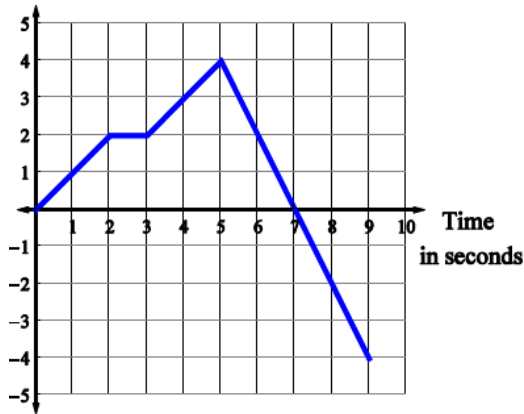


HW Quiz B: Particle Motion

1. Given the graph of the velocity($v(t)$) answer the questions below



- a. At what times is particle moving to the left? Give a reason for your answer.
- b. At what times is the particle moving to the right? Give a reason for your answer.
- c. At what times is the particle stopped? Give a reason for your answer.
- d. When is the acceleration positive? Give a reason for your answer?
- e. When is the acceleration negative? Give a reason for your answer?
- f. When is the acceleration zero? Give a reason for your answer?
- g. When is the acceleration undefined? Give a reason for your answer.
- h. When is the particle at its greatest speed? Give a reason for your answer.
- i. When is the speed increasing? Give a reason for your answer.
- j. When is the speed decreasing. Give a reason for your answer?
- k. Graph the acceleration on the original graph above.

2. Use the equation $s(t) = \frac{1}{3}t^3 - \frac{7}{2}t^2 + 10t$ to answer the following questions
- Find the displacement during the first 2 seconds.
 - Find the average velocity during the first 2 seconds.
 - Find the instantaneous velocity at any time t .
 - Find the acceleration of the particle at any time t .
 - When is the particle at rest?
 - Describe the motion of the particle.
 - Determine the speed of the particle when the acceleration is zero.

3. Hot water is dripping through a coffeemaker, filling a large cup with coffee. The amount of coffee in the cup at time t , $0 \leq t \leq 6$, is given by a differentiable function C , where t is measured in minutes. Selected values of $C(t)$, measured in ounces, are given in the table.

t(minutes)	0	1	2	3	4	5	6
C(t) ounces	0	5.3	8.8	11.2	12.8	13.8	14.5

- Use the data in the table to approximate $C'(4.5)$. Show the computations that lead to your answer, indicate units of measure, and interpret the answer.
4. The number of gallons of water in a tank t minutes after the tank has started to drain is $G(t) = 400(20 - t)^2$.
- How fast is the water running out at the end of 5 minutes?
 - What is the average rate at which the water flows out during the first 10 minutes?