



Physics Olympiad and Problem Solving Programs

N210 - Introductory Physics Olympiad

Problem Set 5.2 - Mock Exam: Motion Graphics Solutions

Name:

Date:

1. C. Leading zeros are not significant, but trailing zeros are significant.
2. C. At $t = 4.0$ s, the graph shows the largest slope which is the instantaneous velocity.
3. C. Since $v_0 = 0$, we have a simpler distance formula:

$$x = \frac{1}{2}at^2, \text{ solve for } t = \sqrt{\frac{2x}{a}} = \sqrt{\frac{2 \times 10}{2.5}} = \sqrt{8} = \boxed{2.8 \text{ s}}.$$

4. C. From 0 to 5 seconds, the velocity is positive, which means the car is moving away from the origin. After 5 seconds, the velocity turns negative, which means it moves back toward origin. Therefore, the answer is $t = \boxed{5 \text{ s}}$.
5. D. We need to calculate the total distance of the car by adding the areas. From 0 to 5 seconds, the car's distance traveled is 32 m. From 5 to 10 second, its distance traveled is 18 m. The average speed is

$$v = \frac{d}{t} = \frac{32 + 18}{10} = \boxed{5.00 \text{ m/s}}.$$