

Mechanics I – Quiz 4 - Group A

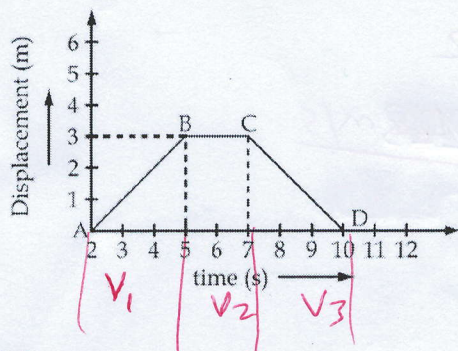
2019-2020

Dec 5, 2019

Full Name: **KEY**

(The quiz is over 2 marks)

1. Plot the velocity-time graph for the given displacement-time graph.

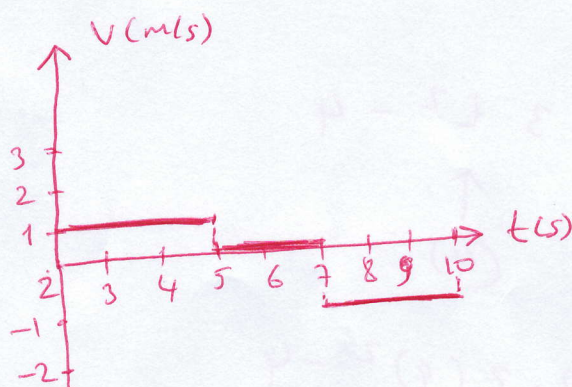


Answers

$$V_1 = \frac{\Delta x_1}{\Delta t_1} = \frac{3-0}{5-2} = \frac{3}{3} = +1 \text{ m/s}$$

$$V_2 = \frac{\Delta x_2}{\Delta t_2} = \frac{3-3}{7-5} = \frac{0}{2} = 0 \text{ m/s}$$

$$V_3 = \frac{\Delta x_3}{\Delta t_3} = \frac{0-3}{10-7} = \frac{-3}{3} = -1 \text{ m/s}$$



2. The position of a particle moving on an x axis is given by $x = 2t^3 - 4t + 10$

with x in meters and t in seconds.

A. What is the position of the particle at t = 2 seconds?

C. Find the velocity at t = 4.0 s.

$$2. \quad x = 2t^3 - 4t + 10$$

$$\begin{aligned} \text{A) } t \rightarrow 2 \quad x &= 2 \cdot (2)^3 - 4(2) + 10 \\ &= 16 - 8 + 10 \\ &= 18 \text{ m} \end{aligned}$$

$$\text{B) } t \rightarrow 4$$

$$v = \frac{dx}{dt} = 2 \cdot 3 \cdot t^2 - 4$$

↑
(4)

$$v = 2 \cdot 3 \cdot (4)^2 - 4$$

$$v = 92 \text{ m/s}$$