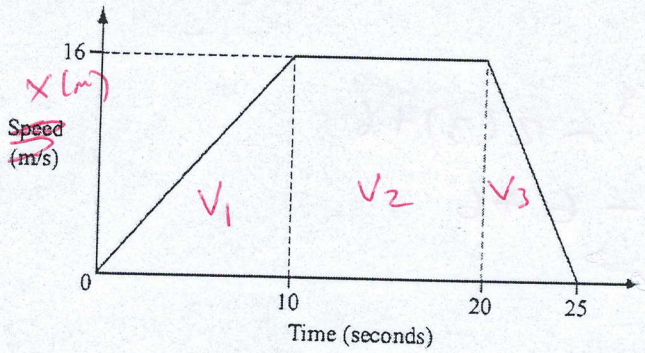
Mechanics I – Quiz 4 - Group B

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.

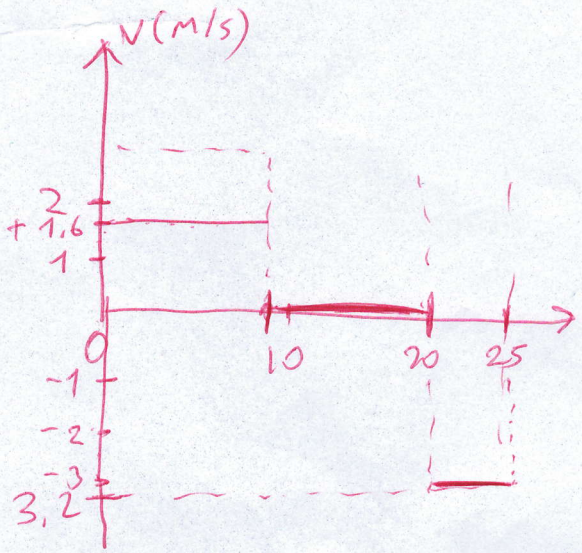


Answers

$$V_1 = \frac{\Delta x_1}{\Delta t_1} = \frac{16-0}{10-0} = \frac{16m}{10s} = 1.6\ \frac{m}{s}$$

$$V_2 = \frac{\Delta x_2}{\Delta t_2} = \frac{16-16}{20-10} = 0\ m/s$$

$$V_3 = \frac{\Delta x_3}{\Delta t_3} = \frac{0-16}{25-20} = \frac{-16}{5} = -3.2\ \frac{m}{s}$$



2. The position of a particle moving on an x axis is given by $\mathbf{x = 3t^3 - 2t + 6}$

with x in meters and t in seconds.

A. What is the position of the particle at t =3 seconds?

B. Find the velocity at t = 5 s.

Answers

A. $t \to 3$ $\quad x = 3(3)^3 - 2(3) + 6$

$= 81 - 6 + 6$

$= 81\,m$

B. $v = \frac{dx}{dt} = \frac{d(3t^3 - 2t + 6)}{dt}$

$= 9t^2 - 2$

$t \to 5$ $\quad v = 9(5)^2 - 2 = 223\ \frac{m}{s}$