Answer on Question 56261, Physics, Mechanics, Relativity

Question:

A particle moves along the x-axis in such a way that its position at any instant is given by $x = 5t^2 + 1$, where x is in metres and t is in seconds. Calculate the instantaneous velocity at $2s$.

a) $20ms^{-1}$

b) $30ms^{-1}$

c) $50ms^{-1}$

d) $25ms^{-1}$

Solution:

By the definition of the instantaneous velocity we have:

$$v = \frac{dx}{dt} = \frac{d(5t^2 + 1)}{dt} = 10t.$$

Then, the instantaneous velocity at $t = 2s$ will be:

$$v(2s) = 10 \cdot 2 = 20ms^{-1}$$

Answer:

a) $20ms^{-1}$