Answer on Question #51989 – Physics – Other

Question.

The displacement of a particle along the X-axis is given as $x = 5t^2 + 1$, where x is in metres and t in seconds. Calculate its average velocity in the time interval between 2 s and 3 s.
Given:
$x = 5t^2 + 1\ (m)$
$t_1 = 2\ s;\ t_2 = 3\ s$

Find:
$v_{av}(t_1, t_2) = ?$

Solution.

By definition:

$$v_{av} = \frac{\Delta x}{\Delta t}$$

Therefore,

$$v_{av}(t_1, t_2) = \frac{x(t_2) - x(t_1)}{t_2 - t_1} = \frac{5t_2^2 - 5t_1^2}{1} = 5(t_2^2 - t_1^2)$$

So,

$$v_{av}(t_1, t_2) = 5(t_2^2 - t_1^2) = 5(9 - 4) = 25\frac{m}{s}$$

Answer.

$$v_{av}(t_1, t_2) = 5(t_2^2 - t_1^2) = 25\ \frac{m}{s}$$