

Name:

Sec.# (7) ---Quiz (2), Ch#2

S.N:

ID# :

Phys 101 (Teto '263)-(F. Enaya)

Show your steps clearly for full credit.

Q. An object moving along the x axis has a position given by: $x = (3 t - t^3)$, where x is measured in (m) and t in (s).

a. Find the average velocity of the object during the first 4 seconds.

First: find x_1 at $t = 0$ s and x_2 at $t = 4$ s, using the given equation for x.

$$x_1 = 0, \quad x_2 = -52$$

$$v_{\text{avg}} = (\Delta x) / (\Delta t) = (-52 - 0) / (4) = -13 \text{ m/s}$$

b. What is the acceleration of the object when its velocity is zero?

Instantaneous acceleration : $a = d^2x/dt^2 = -6 t$.

Now : $v = dx/dt = 3 - 3 t^2$, to find (t) when $v = 0$. $\Rightarrow 3 - 3 t^2 = 0$

$\Rightarrow t = \pm 1$ s .(neglecting negative answer for t), substitute in (a):

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$$\Rightarrow a = -6 (1) = - 6 \text{ m/s}^2 .$$