

Answer on Question #53840 – Math – Calculus

The position of an object at time t is given by $s(t) = -2 - 6t$. Find the instantaneous velocity at $t = 2$ by finding the derivative.

Solution

$$s(t) = -2 - 6t. \quad (1)$$

According to (1), the first derivative of $s(t)$ with respect to t is

$$s'(t) = (-2 - 6t)' = (-2)' + (-6t)' = 0 - 6 \cdot 1 = -6 \quad (2)$$

In (2) we used the following formulae:

$$(f(t) - g(t))' = (f(t))' - (g(t))',$$

$$(Af(t))' = A \cdot (f(t))', \text{ where } A \text{ is a constant,}$$

$$(c)' = 0, \text{ where } c \text{ is a constant,}$$

$$t' = 1.$$

Taking into account (2), the instantaneous velocity at $t = 2$ is

$$v_i(2) = s'(2) = -6.$$