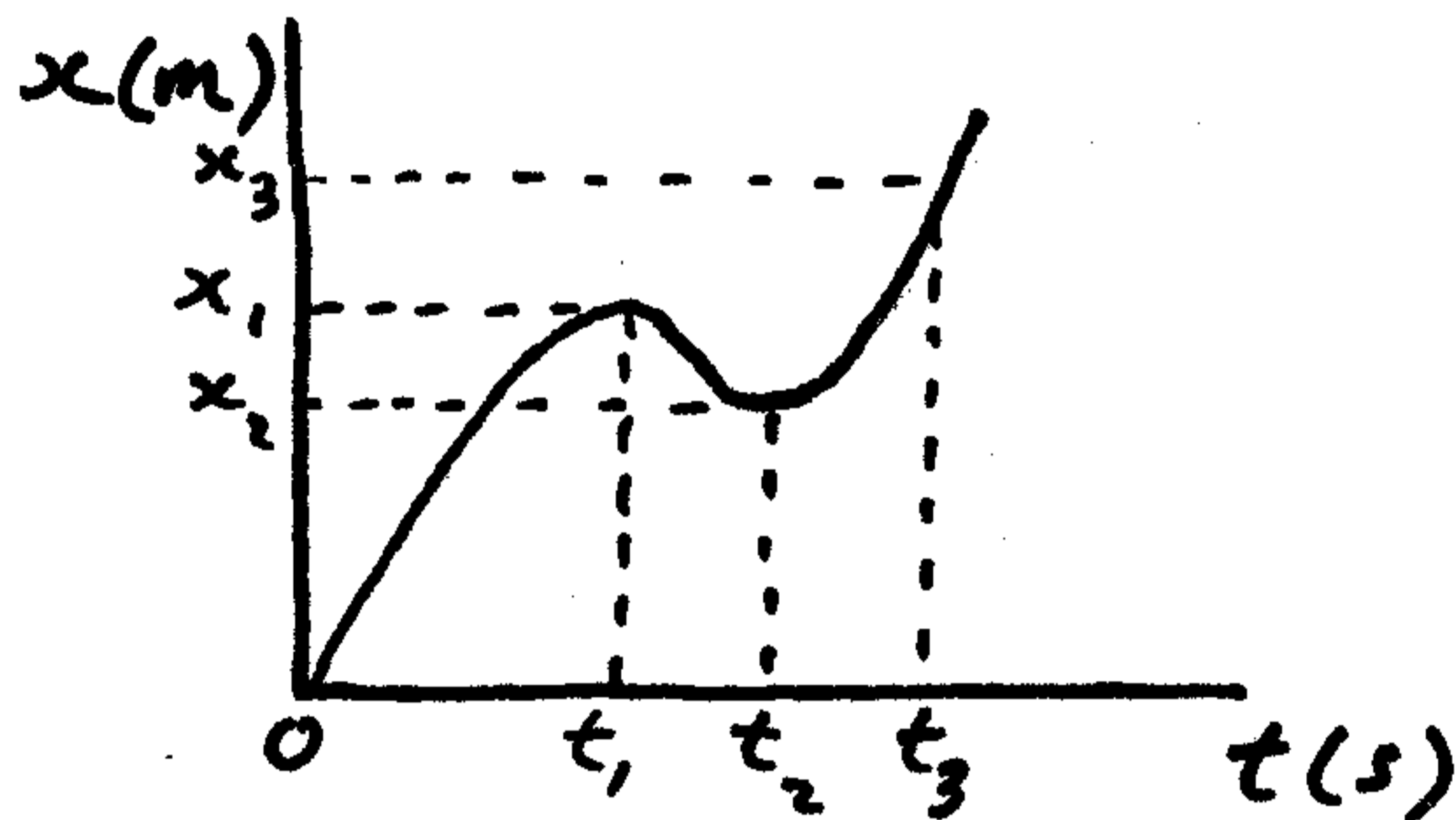


This is a 1-D problem involving average velocity and average speed.



The position of an object moving along the x -axis is shown in the above graph, where x is in meters and t is in seconds.

(a) What is the average velocity of the object between 0 and t_3 ?

(b) What is the average speed of the object between 0 and t_3 ?

Solution:

(a) Between 0 and t_3 , displacement = $x_3 - 0 = x_3$

Then, average velocity = $\frac{\text{displacement}}{\Delta t}$

$$= \frac{x_3}{t_3 - 0} = \frac{x_3}{t_3} \text{ (ans.)}$$

(b) Between 0 and t_3 , total travel distance

Then, average speed

$$= \frac{\text{total travel distance}}{\Delta t}$$

$$= \frac{2x_1 - 2x_2 + x_3}{t_3 - 0}$$

$$= \frac{2(x_1 - x_2) + x_3}{t_3}$$

$$= x_1 + (x_1 - x_2) + (x_3 - x_2) = 2x_1 - 2x_2 + x_3$$

(answer)