Answer on Question 64231, Physics, Mechanics, Relativity

Question:

An object is traveling with a constant acceleration of $10\ m/s^2$. How much distance will it travel in 3-rd second of its journey?

Solution:

We can find the distance traveled by the object from the kinematic equation:

$$d = v_0 t + \frac{1}{2} a t^2,$$

here, v_0 is the initial velocity of the object, a is the acceleration of the object, t is time.

Since the object initially starts from rest ($v_0 = 0\ m/s$), we get:

$$d_3 = \frac{1}{2} a t^2 = \frac{1}{2} \cdot 10\ \frac{m}{s^2} \cdot (3\ s)^2 = 45\ m.$$

$$d_2 = \frac{1}{2} a t^2 = \frac{1}{2} \cdot 10\ \frac{m}{s^2} \cdot (2\ s)^2 = 20\ m.$$

$$\Delta d = d_3 - d_2 = 25\ m.$$

Answer:

$\Delta d = 25\ m.$