Answer on Question#54924 – Physics – Mechanics | Kinematics | Dynamics

(2) 2.25

Question

A particle starts moving with acceleration $2\,\frac{m}{s^2}$. Distance travelled by it in $5th$ half second is

(1) 1.25

(2) 2.25

(3) 6.25

(4) 30.25

All are in meter

Solution

Use the formula of distance travelled during first t seconds:

$L = \frac{at^2}{2} + V_0 t$, where L – distance (m), a – acceleration $\left(\frac{m}{s^2}\right)$, V_0 – initial velocity $\left(\frac{m}{s}\right)$.

"Starts moving" → initial velocity $= 0\,\frac{m}{s}$.

Then, if we put in numbers: $L = \frac{2t^2}{2} + 0t = t^2$; t in seconds, L in meters.

Calculate the distance covered in first 2 seconds (L_1) and first 2.5 seconds (L_2).

$$L_1 = 2^2 = 4\ (m)$$

$$L_2 = 2.5^2 = 6.25\ (m)$$

Subtract L_1 from L_2.

$$L_2 - L_1 = 6.25 - 4 = 2.25\ (m)$$

Obtained result is nothing else, but the distance travelled in $5th$ half second.