

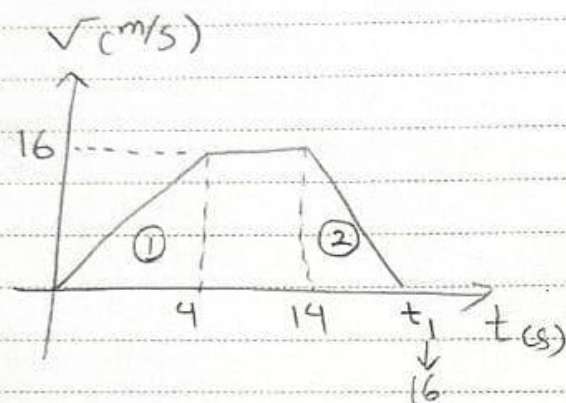
①  $0.00004873221 \text{ s} \rightarrow ? \mu\text{s}$

$\rightarrow 48.73221 \mu\text{s}$

②  $v_0 = 0 \text{ m/s}$   
 $a = 4 \text{ m/s}^2$

$v = at + v_0$

$\rightarrow v = 4 \times 4 + 0 = 16 \text{ m/s}$



$\begin{cases} v_2 = 16 \text{ m/s} \\ a_2 = -8 \text{ m/s}^2 \\ v_2 = 0 \text{ m/s} \end{cases}$

$\rightarrow 0 = -8t + 16 \rightarrow t = 2 \text{ s}$

$\rightarrow t_1 = 14 + 2 = 16 \text{ s}$

مسافت طی شده  
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$\Delta x = \frac{4 \times 16}{2} + 10 \times 16 + \frac{2 \times 16}{2}$

$\rightarrow \Delta x = 32 + 160 + 16 = 208 \text{ m}$

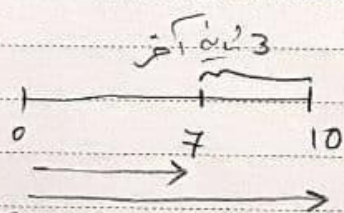
③  $v_0 = 20 \text{ m/s}$

$a = 2 \text{ m/s}^2$

$t = 10 \text{ s}$

در لحظه آخری

$\Delta x = \Delta x - \Delta x$



$\Delta x = \frac{1}{2}at^2 + v_0t$

$t = 10 \text{ s} \rightarrow \Delta x = 300 \text{ m}$

$t = 7 \text{ s} \rightarrow \Delta x = 189 \text{ m}$

$\Delta x = 300 - 189 = 111 \text{ m}$

④  $v_0 = 12 \text{ m/s}$   $\Delta y = -\frac{1}{2}gt^2 + v_0t$

$v^2 - v_0^2 = -2g\Delta y \rightarrow 0 - 12^2 = -2 \times 9.8 \times \Delta y \rightarrow \Delta y = 7.3 \text{ m}$

$v = -gt + v_0 \rightarrow 0 = -9.8t + 12 \rightarrow t = 1.2 \text{ s}$

$5 = -\frac{1}{2}gt^2 + 12t$   $\begin{cases} t_1 = 0.53 \text{ s} \\ t_2 = 1.9 \text{ s} \end{cases}$

$$\textcircled{5} \quad \text{ا) } \int x^3 + 2x^2 + \frac{3}{5}x \, dx = \frac{1}{4}x^4 + \frac{2}{3}x^3 + \frac{3}{10}x^2 + C_1$$

$$\text{ب) } \int x^4 + x^2 + 7 \, dx = \frac{1}{5}x^5 + \frac{1}{3}x^3 + 7x + C_2$$