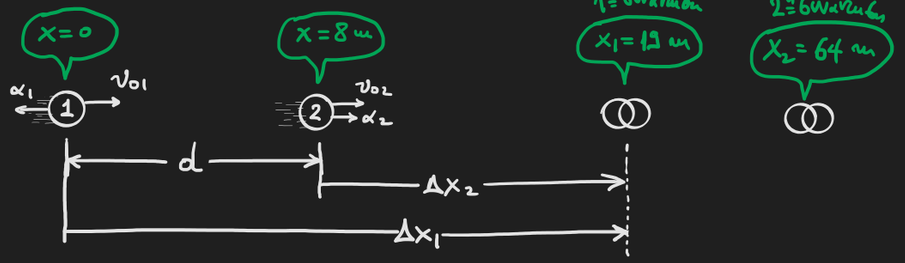
Δε 30·11·2020

PHYSICS

# A4

1ο ΓΕΛ ΣΑΛΑΜΙΝΑΣ




$$\Delta x_1 = d + \Delta x_2 \Rightarrow \upsilon_{01}t - \frac{1}{2}\alpha_1 t^2 = d + \upsilon_{02}t + \frac{1}{2}\alpha_2 t^2 \Rightarrow$$

$$\Rightarrow 20t - \frac{1}{2}\cdot 2\cdot t^2 = 8 + 10t + \frac{1}{2}\cdot 2\cdot t^2 \Rightarrow 20t - t^2 - 8 - 10t - t^2 = 0 \Rightarrow$$

$$\Rightarrow -2t^2 + 10t - 8 = 0 \xrightarrow{\div(-2)} \boxed{t^2 - 5t + 4 = 0}$$

- $\Delta = \beta^2 - 4\alpha\gamma = (-5)^2 - 4\cdot 1\cdot 4 = 25 - 16 = 9$
- $t_{1,2} = \frac{-\beta \pm \sqrt{\Delta}}{2\alpha} = \frac{-(-5) \pm \sqrt{9}}{2\cdot 1}$ $\begin{cases} \frac{5+3}{2} = \frac{8}{2} = \boxed{4\ sec} & (t_2) \\ \frac{5-3}{2} = \frac{2}{2} = \boxed{1\ sec} & (t_1) \end{cases}$ ποτε?

- $\Delta x_1 = \upsilon_{01}t_1 - \frac{1}{2}\alpha_1 t_1^2 = 20\cdot 1 - \frac{1}{2}\cdot 2\cdot 1^2 = 20 - 1 = 19\ m \xrightarrow{x_{01}=0} \boxed{x_1 = 19\ m}$
- $\Delta x_1' = \upsilon_{01}t_2 - \frac{1}{2}\alpha_1 t_2^2 = 20\cdot 4 - \frac{1}{2}\cdot 2\cdot 4^2 = 80 - 16 = 64\ m \xrightarrow{x_{01}=0} \boxed{x_2 = 64\ m}$ πού?

2 συναντήσεις

| 1η | 2η |
|---|---|
| $t_1 = 1\ sec$ | $t_2 = 4\ sec$ |
| $x_1 = 19\ m$ | $x_2 = 64\ m$ |

**1η συνάντηση ($t_1 = 1\ sec$)**

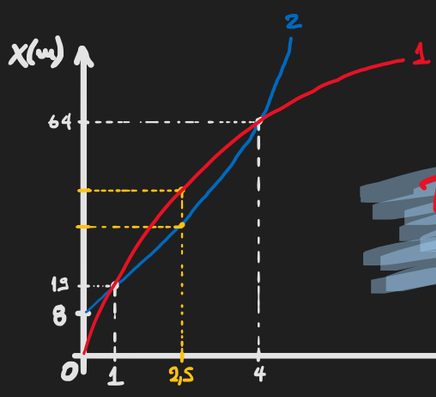
$\upsilon_1 = \upsilon_{01} - \alpha_1 t_1 = 20 - 2\cdot 1 = 18\ m/s$

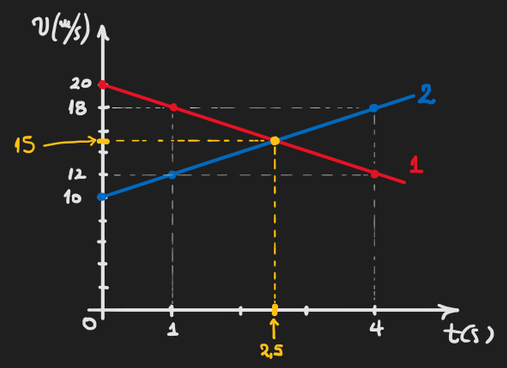
$\upsilon_2 = \upsilon_{02} + \alpha_2 t_1 = 10 + 2\cdot 1 = 12\ m/s$

**2η συνάντηση ($t_2 = 4\ sec$)**

$\upsilon_1' = \upsilon_{01} - \alpha_1 t_2 = 20 - 2\cdot 4 = 12\ m/s$

$\upsilon_2' = \upsilon_{02} + \alpha_2 t_2 = 10 + 2\cdot 4 = 18\ m/s$




**Πότε οι ταχύτητες γίνονται ίσες?**

$\upsilon_1 = \upsilon_2 \Rightarrow$

$\upsilon_{01} - \alpha_1 t = \upsilon_{02} + \alpha_2 t \Rightarrow$

$20 - 2t = 10 + 2t \Rightarrow$

$20 - 10 = 2t + 2t \Rightarrow$

$10 = 4t \Rightarrow$

$t = \frac{10}{4} \Rightarrow \boxed{t = 2{,}5\ sec}$

$\upsilon_1 = \upsilon_{01} - \alpha_1 t =$

$= 20 - 2\cdot 2{,}5 =$

$= 20 - 5 = \boxed{15\ m/s}$

$\upsilon_2 = \upsilon_{02} + \alpha_2 t =$

$= 10 + 2\cdot 2{,}5 =$

$= 10 + 5 = \boxed{15\ m/s}$

To be Continued....