

ΛΥΣΕΙΣ ΔΙΑΓΩΝΙΣΜΑΤΟΣ ΦΥΣΙΚΗΣ Α' ΛΥΚΕΙΟΥ

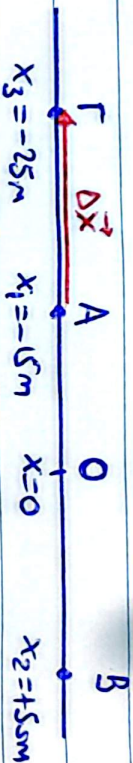
26/10/2025

ΘΕΜΑ Α

Α) Β Α2) α Α3) γ Α4) β Α5) Σ, Λ, Λ, Σ, Λ

ΘΕΜΑ Β

Β1) α) $\Delta x = x_{\text{τελ}} - x_{\text{αρχ}} = x_3 - x_1 = -25\text{m} - (-15\text{m}) \Rightarrow$
 $\Delta x = -10\text{m}$



β) $A \rightarrow B: s_1 = 65\text{m}$

$B \rightarrow A: s_2 = 75\text{m}$

$s_{\text{ολ}} = s_1 + s_2 = 65\text{m} + 75\text{m} \Rightarrow s_{\text{ολ}} = 140\text{m}$

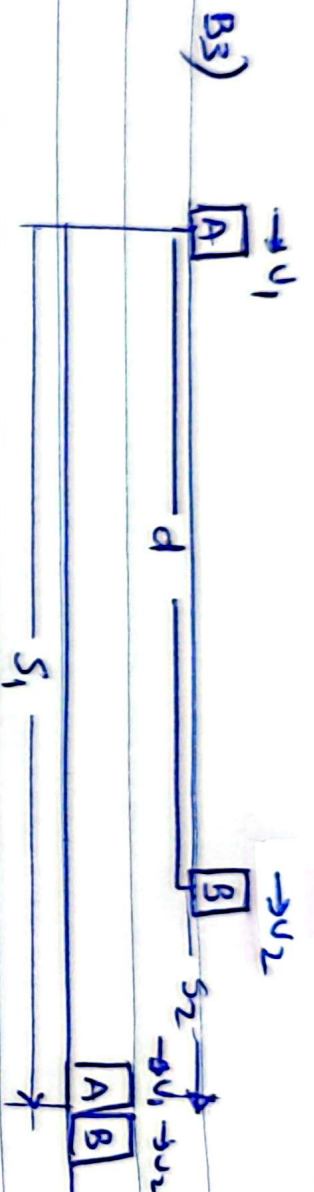
β2) $x = 10 - 5t \text{ (SI)}$
 $x = x_0 + vt$

Από σύγκριση: $x_0 = +10\text{m}$ και $v = -5\text{m/s}$

Ι) $v = -5\text{m/s}$ Σωστό το (γ)

ΙΙ) $\Delta t = t_2 - t_1 = 9\text{s}$

$v = \frac{\Delta x}{\Delta t} \Rightarrow \Delta x = v \cdot \Delta t = -5 \cdot 9 \text{ m} \Rightarrow \Delta x = -45\text{m}$
 Σωστό το (β)



$$S_1 = d + S_2 \Rightarrow v_1 t = d + v_2 t \Rightarrow 12t = 80 + 4t \Rightarrow$$

$$\Rightarrow 8t = 80 \Rightarrow t = 10s$$

$$S_1 = v_1 t = 12 \cdot 10 \Rightarrow S_1 = 120m \quad \text{Συνολικό } \tau_0(8)$$

B4)

$$\alpha) v_1 = \frac{x_{\text{τελ}} - x_{\text{αρχ}}}{t_{\text{τελ}} - t_{\text{αρχ}}} = \frac{200 - 50 \text{ m}}{10 - 0s} = \frac{150 \text{ m}}{10s} \Rightarrow v_1 = 15 \text{ m/s}$$

$$v_2 = \frac{x_{\text{τελ}} - x_{\text{αρχ}}}{t_{\text{τελ}} - t_{\text{αρχ}}} = \frac{200 - (-50)}{10 - 0} \text{ m/s} = \frac{250 \text{ m}}{10s} \Rightarrow v_2 = 25 \text{ m/s}$$

Αρα $v_1 < v_2$. Η (α) προφανώς είναι λανθασμένη.

β)

Το κινώ (1) έχει επίσυνω κίνηση:

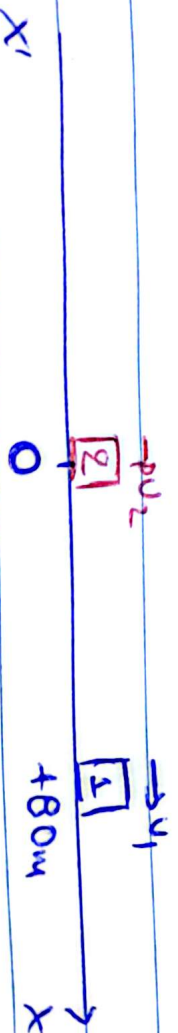
$$x_1 = 50 + 15t \quad (SI)$$

$$\text{Για } t = 2s: x_1 = 50 + 15 \cdot 2 \Rightarrow x_1 = 80m$$

Το κινώ (2) έχει επίσυνω κίνηση:

$$x_2 = -50 + 25t \quad (SI)$$

$$\text{Για } t = 2s: x_2 = -50 + 25 \cdot 2 \Rightarrow x_2 = 0m.$$



ΘΕΜΑ Γ

Γ1)

0-2s: Έκτ $\mu \in \upsilon_1 = +10 \text{ m/s}$

$\Delta x_1 = E_1 = 25 \cdot 10 \text{ m/s} \Rightarrow \Delta x_1 = 250 \text{ m}$

$s_1 = |\Delta x_1| = 250 \text{ m}$

2s-4s Ακίνητος $\upsilon_2 = 0$

$\Delta x_2 = 0$, $s_2 = 0$

4s-9s Εκτ $\mu \in \upsilon_3 = -9 \text{ m/s}$, Ανεύθυνος μ
 αν τιν Δx είναι

$\Delta x_3 = E_3 = 55 \cdot (-5 \text{ m/s}) \Rightarrow \Delta x_3 = -25 \text{ m}$

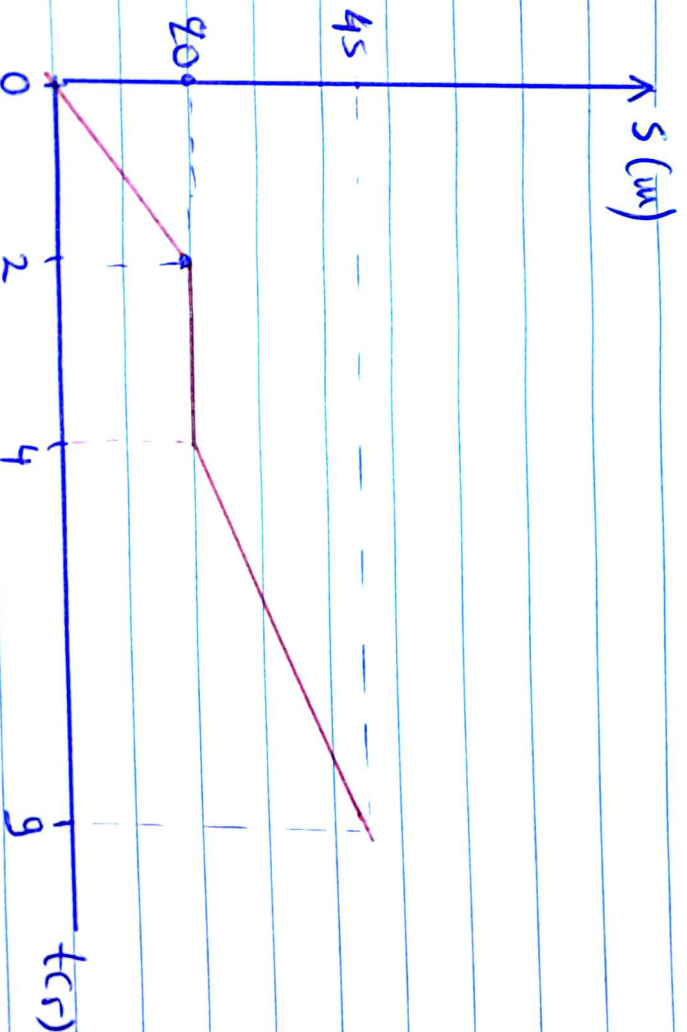
$s_3 = |\Delta x_3| = 25 \text{ m}$

Γ2)

$s_{\text{tot}} = s_1 + s_2 + s_3 = 250 \text{ m} + 0 \text{ m} + 25 \text{ m} \Rightarrow s_{\text{tot}} = 275 \text{ m}$

$\upsilon_{\mu} = \frac{s_{\text{tot}}}{t_{\text{tot}}} = \frac{275 \text{ m}}{9 \text{ s}} \Rightarrow \upsilon_{\mu} = 30.5 \text{ m/s}$

Γ3)



Γ4)

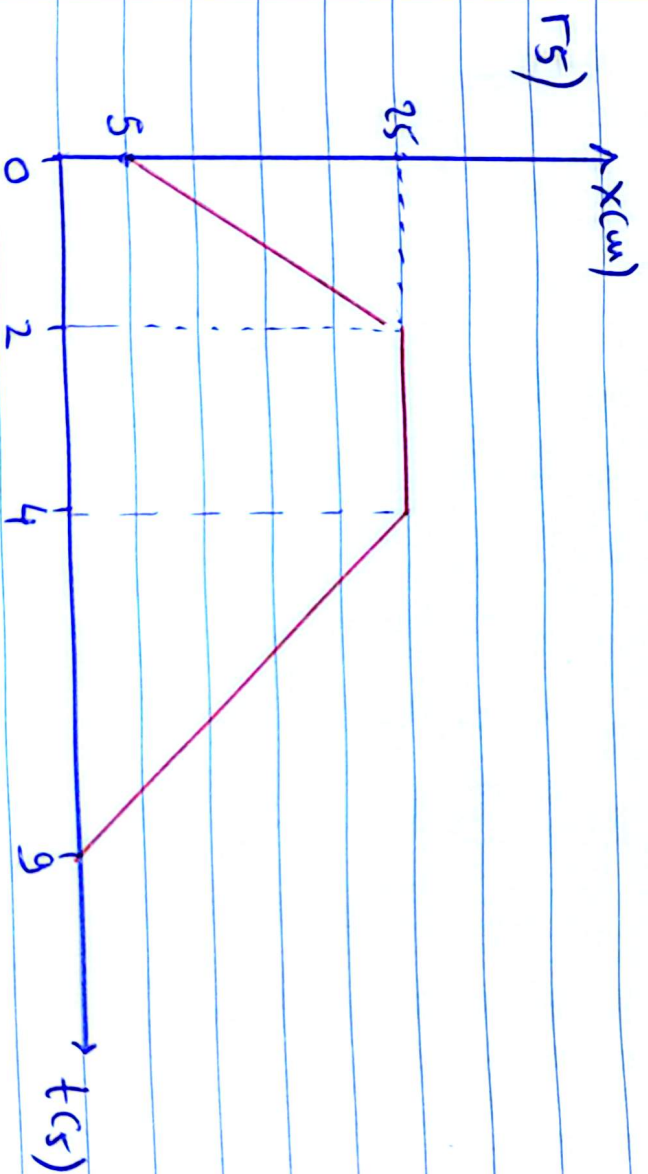
$$X_0 = +15m$$

$$X_1 = \Delta X_1 + X_0 = 20 + 15m \Rightarrow X_1 = +25m$$

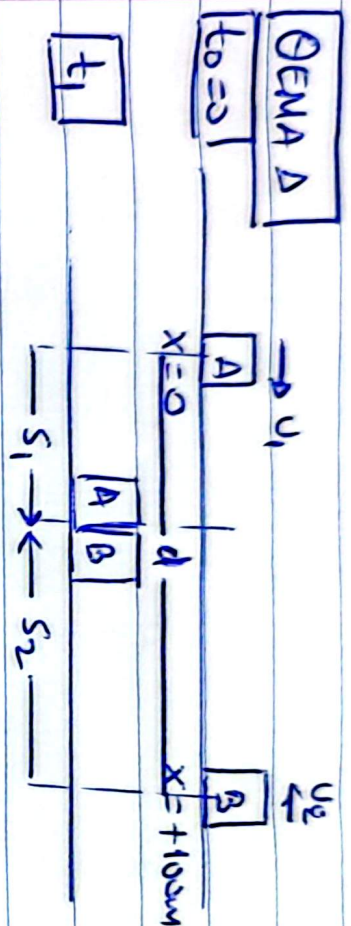
$$X_2 = \Delta X_2 + X_1 = 0m + 25m \Rightarrow X_2 = +25m$$

$$X_3 = \Delta X_3 + X_2 = -25m + 25m \Rightarrow X_3 = 0m$$

Χρονικό διάστημα	$t_{\text{αρχ}}$	$X_{\text{αρχ}}$	$t_{\text{τελ}}$	$X_{\text{τελ}}$	ΔX
0-25	0	+15m	2	+25m	20m
25-45	2	+25m	4	+25m	0m
45-95	4	+25m	9	0m	-25m



+



a1)

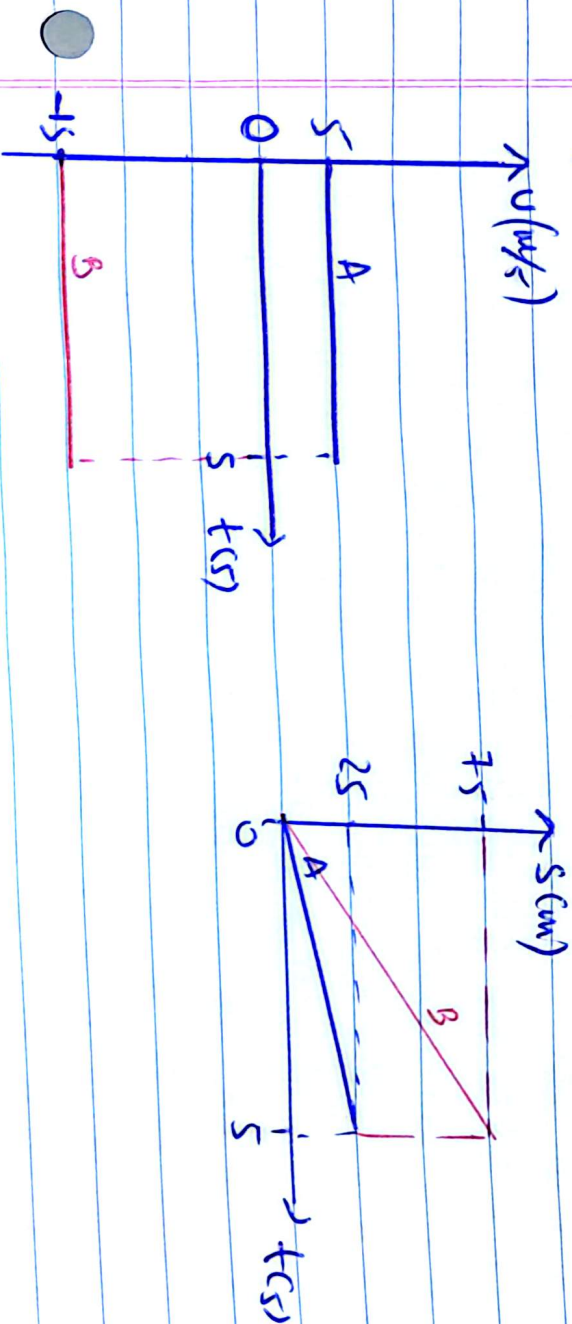
$$d = s_1 + s_2 \Rightarrow 100 = u_1 t_1 + u_2 t_1 \Rightarrow 100 = 5t + 15t \Rightarrow 100 = 20t$$

$$\Rightarrow \boxed{t_1 = 5\text{s}}$$

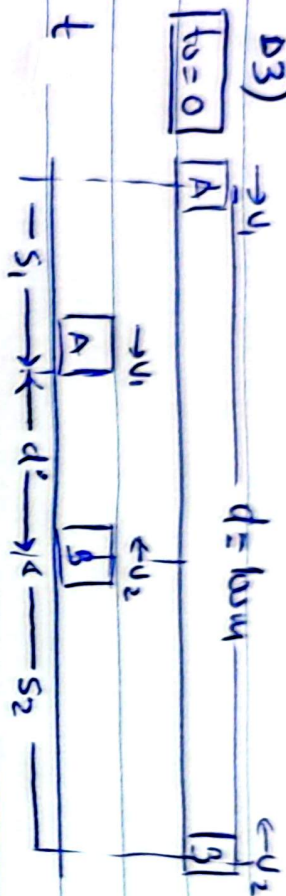
$$s_1 = u_1 t = 5 \cdot 5\text{m} \Rightarrow s_1 = 25\text{m}$$

$$s_2 = u_2 t = 15 \cdot 5\text{m} \Rightarrow s_2 = 75\text{m}$$

Δ2)



Δ3)



$$t_1 = 5s$$



• Αν t η πρώτη φορά που θα μετρώ $d' = 60\text{m}$

τότε ισχύει: $d = s_1 + d' + s_2 \Rightarrow 100 = v_1 \Delta t + 60 + v_1 \Delta t \Rightarrow$

$$\Rightarrow 40 = 5 \Delta t + 15 \Delta t \Rightarrow 40 = 20 \Delta t \Rightarrow \Delta t = 2s \Rightarrow t - 0 = 2s \Rightarrow \boxed{t = 2s}$$

• Αν t' η δεύτερη φορά που μετρώ $d' = 60\text{m}$ τότε στην χρονική στιγμή $t_1 = 5s$ η συνωστισμένη θα περριεί από πάνω πάλι $d' = 60\text{m}$ θα ισχύει:

$$s_1' + s_2' = d' \Rightarrow v_1 \Delta t + v_2 \Delta t = d' \Rightarrow 5 \Delta t + 15 \Delta t = 60 \Rightarrow 20 \Delta t = 60 \Rightarrow$$

$$\Delta t = 3s \Rightarrow t' - t_1 = 3s \Rightarrow t' - 5 = 3s \Rightarrow \boxed{t = 8s}$$

Δ4)

$$\text{ΕΙΝΑΤΟΑ} : x_1 = v_1 t \Rightarrow x_1 = 5t \text{ (SI)}$$

$$\Gamma_{\text{A}} t_0 = 0 : x_1 = 0$$

$$\Gamma_{\text{B}} t = 8s : x_1 = 40\text{m}$$

$$\text{ΕΙΝΑΤΟΒ} : x_2 = +100 - 15t \text{ (SI)}$$

$$\Gamma_{\text{A}} t_0 = 0 : x_2 = +100\text{m}$$

$$\Gamma_{\text{B}} t = 8s : x_2 = 100 - 15 \cdot 8 = -20\text{m}$$

