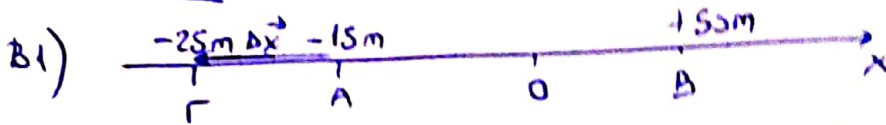


**ΘΕΜΑ Α**

- A1) β A2) α A3) β A4) γ A5) ε, λ, λ, λ, λ

**ΘΕΜΑ Β**

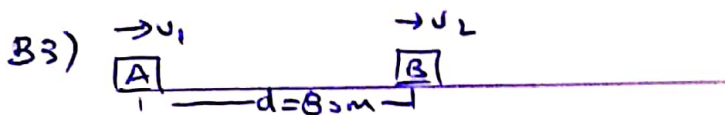


a)  $\Delta x = x_{\text{τελ}} - x_{\text{αρχ}} = x_3 - x_1 = -25\text{m} - (-15\text{m}) = -25\text{m} + 15\text{m} = -10\text{m}$

β)  $A \rightarrow B: s_1 = 65\text{m}$ ,  $B \rightarrow \Gamma: s_2 = 75\text{m}$ ,  $\text{ΣΥΝΟΛΑ: } s_{\text{ολ}} = s_1 + s_2 = 140\text{m}$

B2)  $x = 10 - 5t$  (SI)  $\text{Αρχ } x_0 = 10\text{m}$  και  $u = -5\text{m/s}$

I) Σε 1το το (γ) II)  $x_1 = 10 - 5 \cdot 1 = 5\text{m}$  Σε 5το το (β)  
 $x_2 = 10 - 5 \cdot 10 = -40\text{m}$   
 $\Delta x = x_2 - x_1 = -40\text{m} - (5\text{m}) = -45\text{m}$



Όταν συναντηθούν:  $s_1 = d + s_2 \Rightarrow u_1 t = d + u_2 t \Rightarrow 12t = 80 + 4t \Rightarrow 8t = 80 \Rightarrow t = 10\text{s}$

Αρα  $s_2 = u_2 t = 4 \cdot 10 \Rightarrow \boxed{s_2 = 40\text{m}}$  Σε 5το το (β)

B4) Για το κινητό (1):  $u_1 = \frac{\Delta x_1}{\Delta t_1} = \frac{200 - 50}{10 - 0} = 15\text{m/s}$

Για το κινητό (2):  $u_2 = \frac{\Delta x_2}{\Delta t_2} = \frac{200 - (-50)}{10 - 0} = 25\text{m/s}$

Αρα  $u_2 > u_1$ .

Για το κινητό (1):  $x_1 = 50 + 15t$  (SI) (1)

Για το κινητό (2):  $x_2 = -50 + 25t$  (SI) (2)

a) Αρα  $u_2 > u_1$  η πρόταση είναι **ΛΑΘΟΣ**.

β)  $d = |x_1 - x_2| = |50 + 15t - (-50 + 25t)| = |100 - 10t|$  (SI)

$d = |x_2 - x_1| = |-50 + 25t - (50 + 15t)| = |-100 + 10t|$

Αρα η πρόταση είναι **ΣΩΣΤΗ**.

# ΘΕΜΑ Γ

Γ1) 0-2s : Εοκ,  $\Delta x_1 = E_1 = 60m$ ,  $S_1 = 60m$

2s-4s : Ακίνητο,  $\Delta x_2 = 0$ ,  $S_2 = 0$

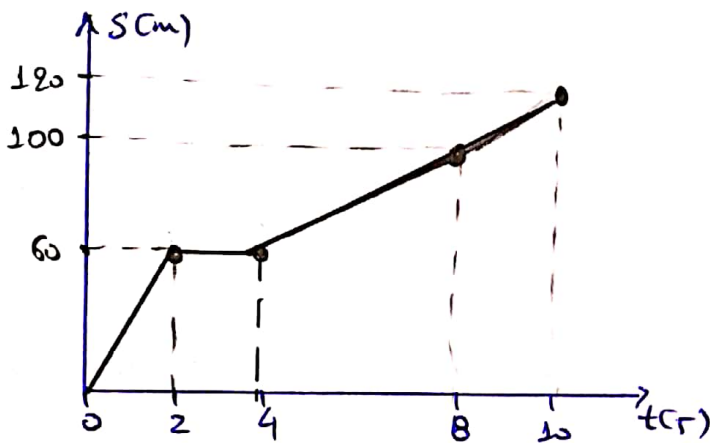
4s-8s : Εοκ (πρ αναίεση φαρ),  $\Delta x_3 = 4m \cdot (-10 \frac{m}{s}) = -4m$ ,  $S_3 = |\Delta x_3| = 4m$

8s-10s : Εοκ,  $\Delta x_4 = 20m$ ,  $S_4 = 20m$

$S_{\text{ολ}} = S_1 + S_2 + S_3 + S_4 = 60m + 0m + 4m + 20m \Rightarrow S_{\text{ολ}} = 120m$

Γ2)  $v_{\text{μ}} = \frac{S_{\text{ολ}}}{t_{\text{ολ}}} = \frac{120m}{10s} = 12 \frac{m}{s}$

Γ3)



Γ4)  $x_0 = +10m$

$\Delta x_1 = x_1 - x_0 \Rightarrow x_1 = \Delta x_1 + x_0 = 60m + 10m \Rightarrow x_1 = +70m$

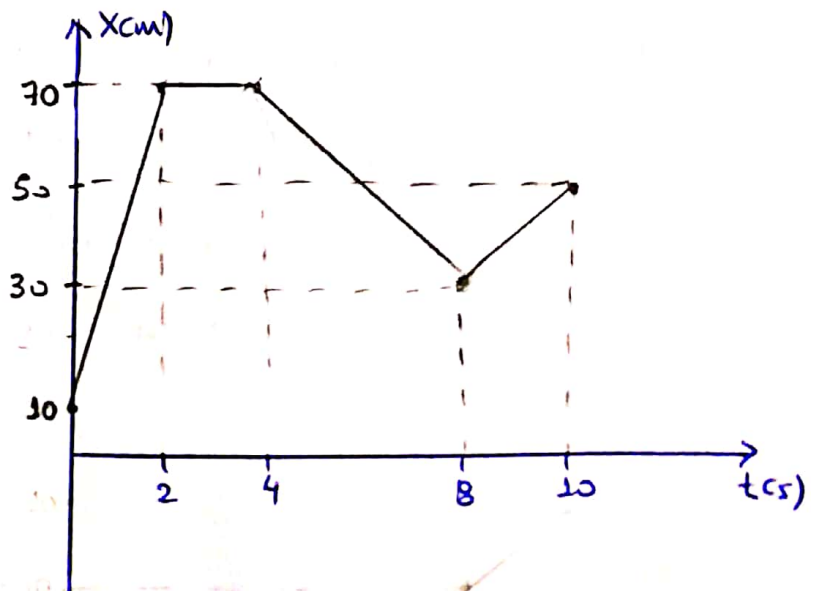
$x_2 = \Delta x_2 + x_1 = 0m + 70m \Rightarrow x_2 = 70m$

$x_3 = \Delta x_3 + x_2 = -40m + 70m \Rightarrow x_3 = +30m$

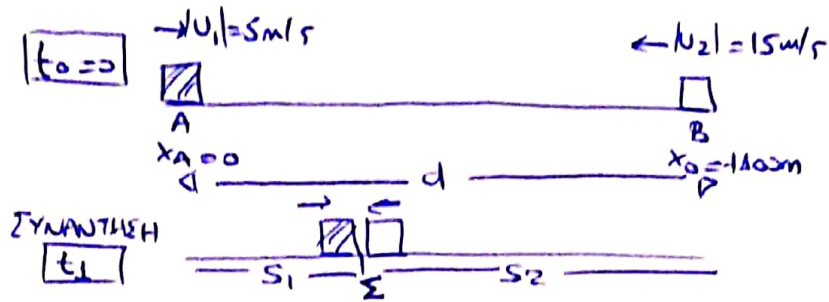
$x_4 = \Delta x_4 + x_3 = 20m + (+30m) \Rightarrow x_4 = +50m$

ΧΡΟΝΙΑ ΔΙΑΣΤΗΜΑ	$t_{\text{αρχ}}$	$x_{\text{αρχ}}$	$t_{\text{τελ}}$	$x_{\text{τελ}}$	$\Delta x$
0-2s	0	10m	2s	70m	60m
2s-4s	2s	70m	4s	70m	0
4s-8s	4s	70m	8s	+30m	-40m
8s-10s	8s	+30m	10s	+50m	20m

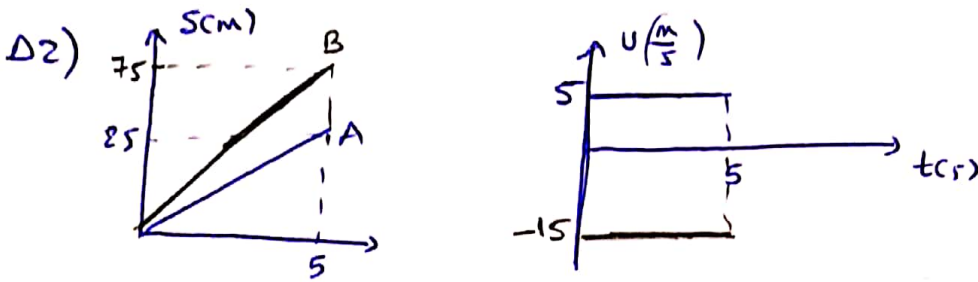
Γ5)



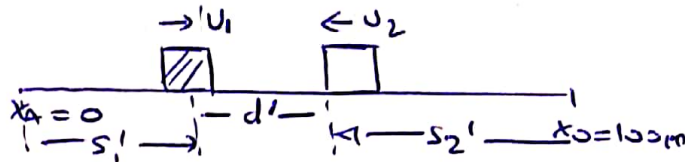
# ΘΕΜΑ Δ



Δ1)  $s_1 + s_2 = d \Rightarrow |u_1|t_1 + |u_2|t_1 = d \Rightarrow 5t_1 + 15t_1 = 100 \Rightarrow \boxed{t_1 = 5 \text{ sec}}$   
 $s_1 = |u_1|t = 5 \cdot 5 \Rightarrow \boxed{s_1 = 25 \text{ m}}$  και  $s_2 = |u_2|t = 15 \cdot 5 \Rightarrow \boxed{s_2 = 75 \text{ m}}$



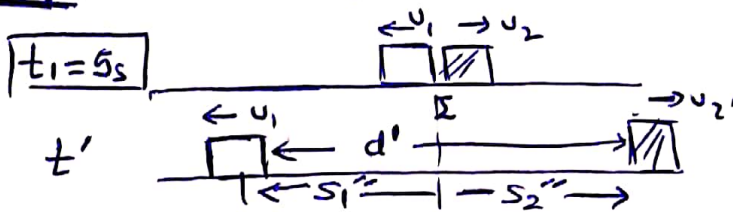
Δ3) 1η φάση  $d' = 80 \text{ m}$  όταν πλησιάζουν:



1σκέρι:

$s_1 + d' + s_2' = d \Rightarrow |u_1| \cdot \Delta t + d' + |u_2| \cdot \Delta t = d \Rightarrow 5\Delta t + 80 + 15\Delta t = 100$   
 $\Rightarrow 20\Delta t = 20 \Rightarrow \Delta t = 1 \text{ s} \Rightarrow t - t_0 = 1 \text{ s} \Rightarrow t - 0 = 1 \text{ s} \Rightarrow \boxed{t = 1 \text{ s}}$   
 1η φάση

2η φάση  $d' = 80 \text{ m}$  μετά την συνάντησή τους:



1σκέρι:

$s_1'' + s_2'' = d' = |u_1| \Delta t + |u_2| \Delta t = d' \Rightarrow 5\Delta t + 15\Delta t = 80 \Rightarrow$   
 $\Rightarrow 20\Delta t = 80 \Rightarrow \Delta t = 4 \text{ s} \Rightarrow t' - t_1 = 4 \text{ s} \Rightarrow t' = t_1 + 4 \text{ s} \Rightarrow$   
 $t' = 5 + 4 \text{ s} \Rightarrow \boxed{t' = 9 \text{ s}}$  2η φάση

Δ4)

Kίνηση A.  $x_1 = 5t$  (s.s.)

Για  $t_0 = 0$  :  $x_1 = 0$

Για  $t = 9s$  :  $x_1 = 45m$

Kίνηση B  $x_2 = 100 - 15t$  (s.s.)

Για  $t_0 = 0$  :  $x_2 = 100m$

Για  $t = 9s$  :  $x_2 = -35m$

