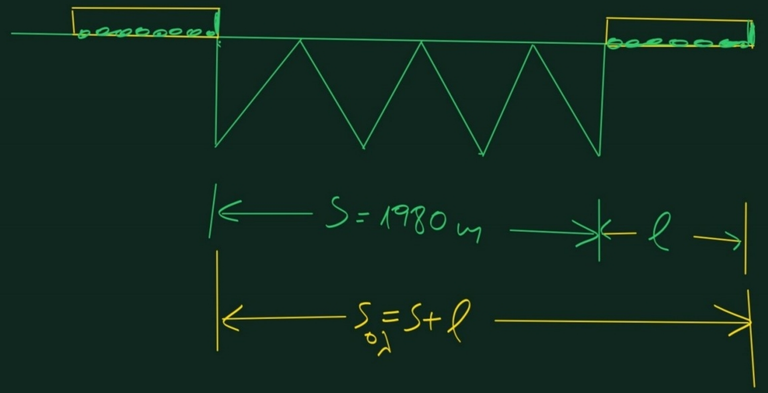
Ασκ. 2 σελ. 69



$$υ = \frac{S_{ολ}}{Δt} \Rightarrow$$

$$10 = \frac{1980 + 20}{Δt} \Rightarrow$$

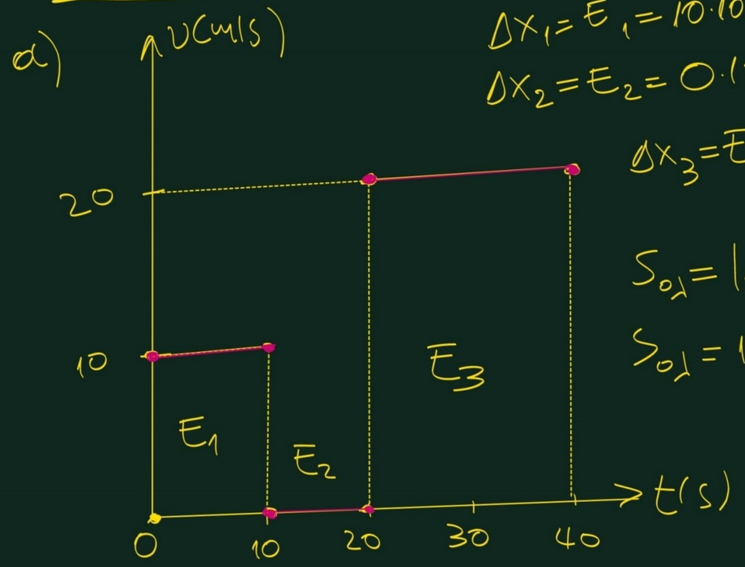
$$\frac{10}{1} = \frac{2.000}{Δt} \Rightarrow$$

$$10 \cdot Δt = 2.000 \Rightarrow$$

$$Δt = 200 \text{ sec}$$

Ασκ. 3 σελ. 69.

α)



Από 0 → 10 sec.

$\Delta x_1 = E_1 = 10 \cdot 10 = 100\,m$

$\Delta x_2 = E_2 = 0 \cdot 10 = 0\,m$

$\Delta x_3 = E_3 = 20 \cdot 20 = 400\,m$

$S_{ολ} = |\Delta x_1| + |\Delta x_2| + |\Delta x_3| \Rightarrow$

$S_{ολ} = 100 + 0 + 400 = 500\,m$

β) $v_μ = \frac{S_{ολ}}{t_{ολ}} = \frac{500}{40} \Rightarrow$

$v_μ = 12,5\,m/s.$

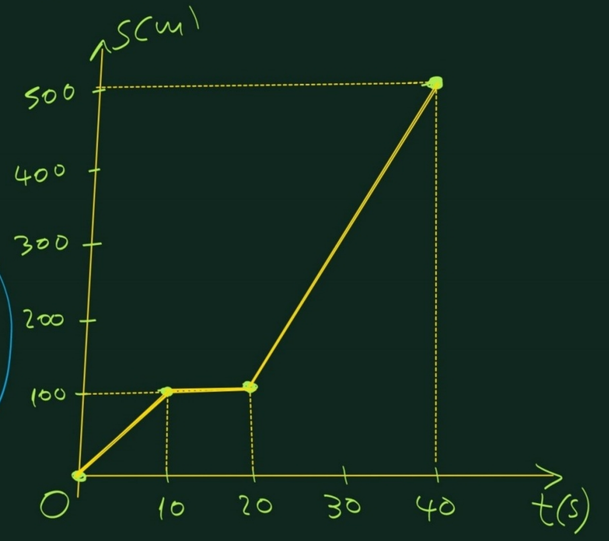
$S = v \cdot t$ | Συνάρτηση 1ου βαθμού δηλαδή ευθεία.

γ) Από 0 → 10 sec : $S_1 = |\Delta x_1| = 100\,m.$

Από 0 → 20 sec : $S_2 = |\Delta x_1| + |\Delta x_2| = 100\,m.$

Από 0 → 40 sec

$S_{ολ} = 500\,m.$



Διάγραμμα x-t

$x(0) = 0\ m$

$\Delta x_1 = 100\ m$

Άρα: $x(10) - \cancel{x(0)}^{0} = 100 \Rightarrow$

$x(10) = 100\ m$

$\Delta x_2 = 0\ m.$

$\Delta x_2 = x(20) - x(10) \Rightarrow$

$0 = x(20) - 100 \Rightarrow$

$x(20) = 100\ m.$

$\Delta x_3 = 20 \cdot 20 = 400\ m.$

$\Delta x_3 = x(40) - x(20) \Rightarrow$

$400 = x(40) - 100 \Rightarrow$

$x(40) = 500\ m$

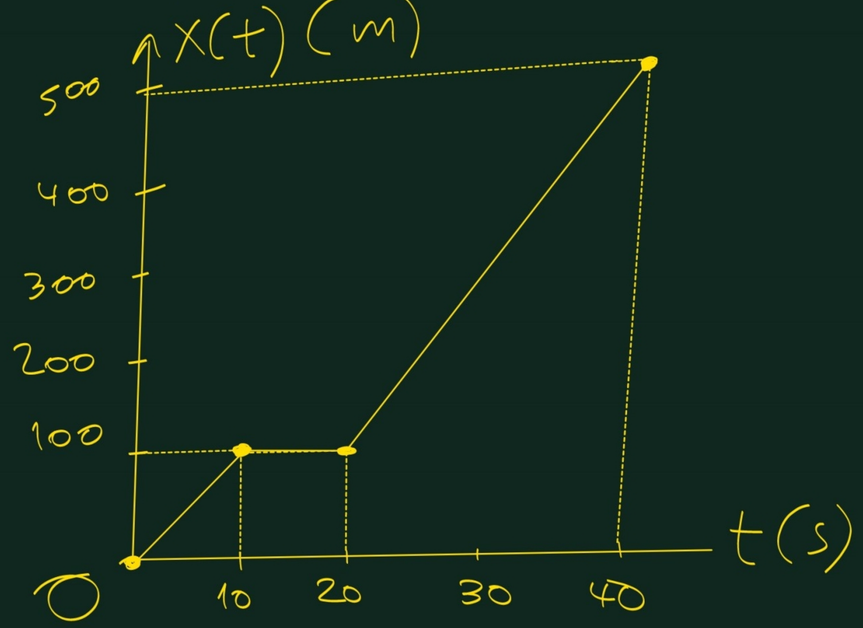
Άρα: $x(0) = 0\ m$

$x(10) = 100\ m$

$x(20) = 100\ m$

$x(40) = 500\ m$

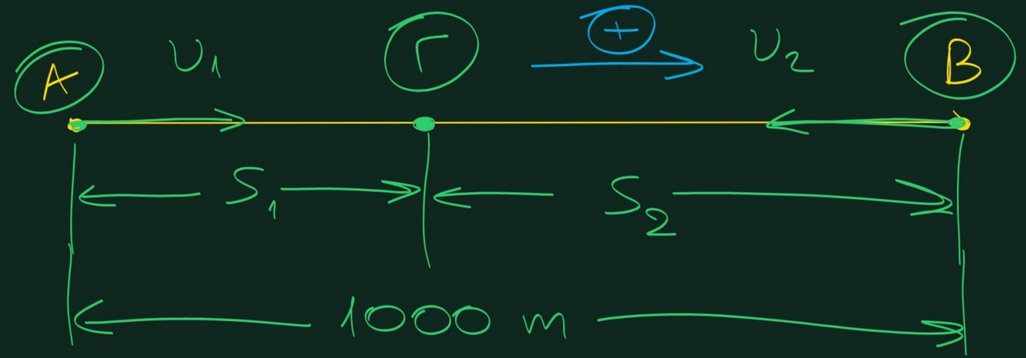
Διάγραμμα θέσης – χρόνου



Ασκ. 4 σελ. 69

Α. $v_1 = 36\,km/h = \frac{36.000\,m}{3.600\,sec} = 10\,m/s$

$v_2 = 54\,km/h = \frac{54.000\,m}{3.600\,sec} = 15\,m/s.$



$S_1 = v_1 \cdot t \Rightarrow S_1 = 10t$

$S_2 = v_2 \cdot t \Rightarrow S_2 = 15t$

Χρόνος συνάντησης

$S_1 + S_2 = 1000 \Rightarrow$

$10t + 15t = 1000 \Rightarrow$

$\frac{25t}{25} = \frac{1.000}{25} \Rightarrow$

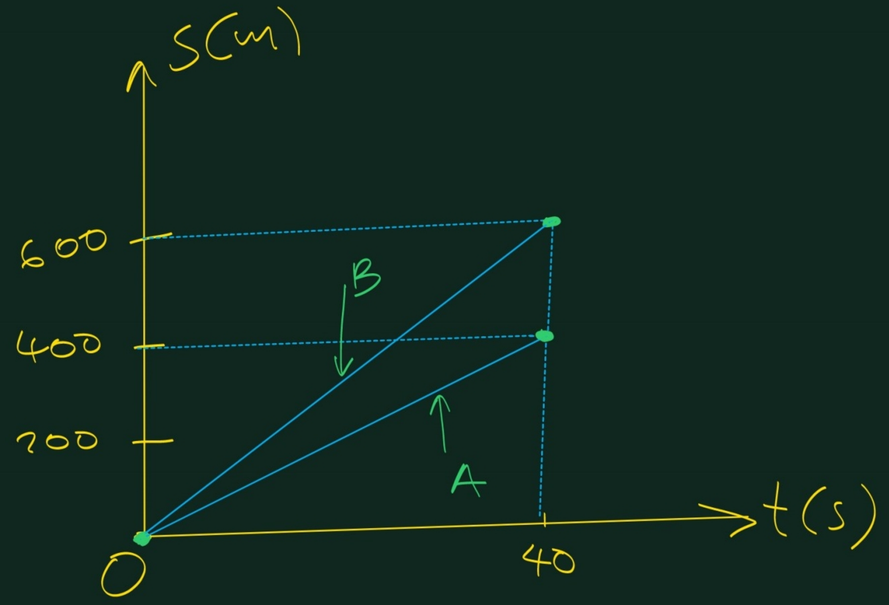
$t = 40\,sec.$

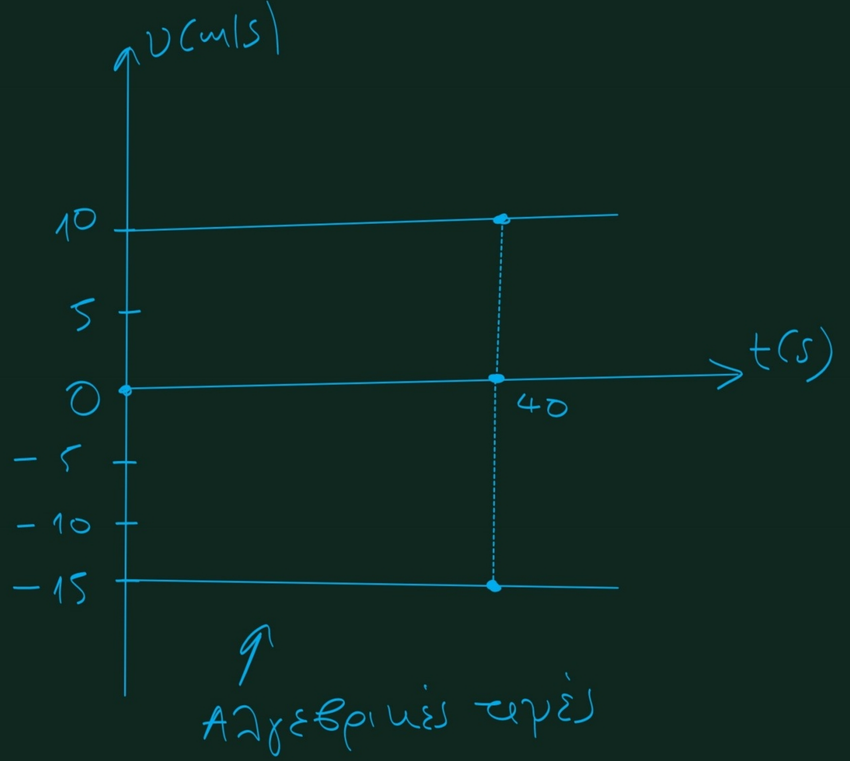
Σημείο συνάντησης.

$S_1 = 10t = 400\,m$

$S_2 = 15t = 600\,m$

Β. Διάγραμμα S – t

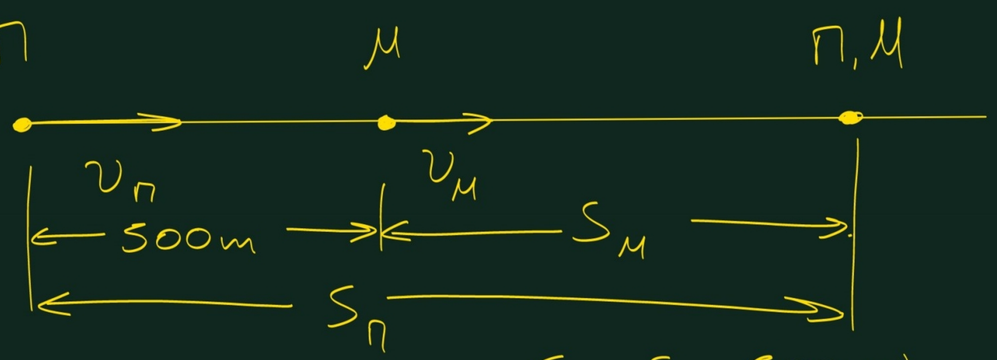




Αλγεβρικές τιμές

Ασκ. 5 σελ. 69

A.



$v_Π = 30 m/s$

$v_Μ = 20 m/s$

$S_Π - S_Μ = 500 \Rightarrow$

$v_Π \cdot t - v_Μ \cdot t = 500 \Rightarrow$

$30t - 20t = 500 \Rightarrow$

$\frac{10 \cdot t}{10} = \frac{500}{10} \Rightarrow t = 50 sec$

B. $S_Π = v_Π \cdot t \Rightarrow$

$S_Π = 30 \cdot 50 \Rightarrow$

$S_Π = 1500 m.$

Ασκ. 6 σελ. 69

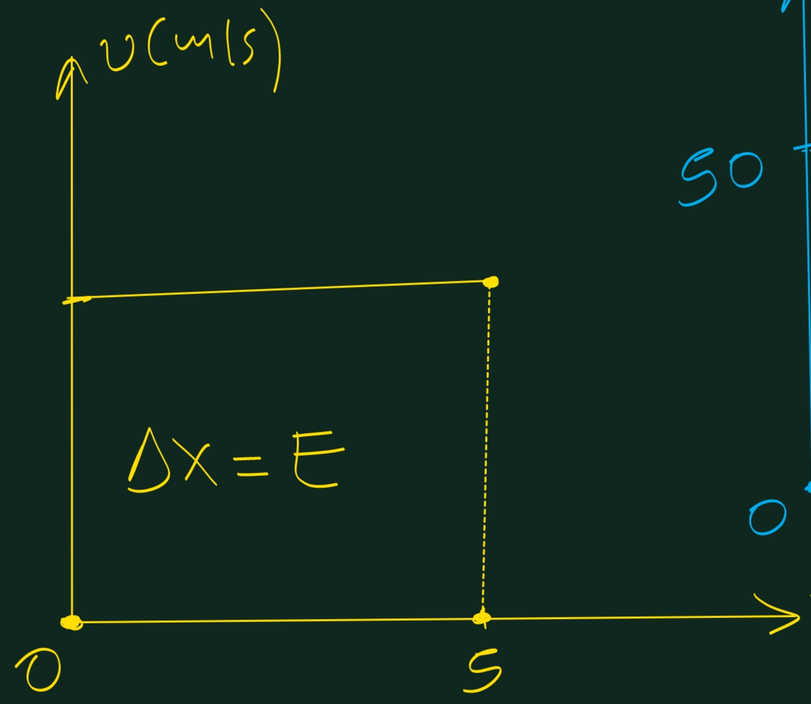
$X = 10t$ (SI)

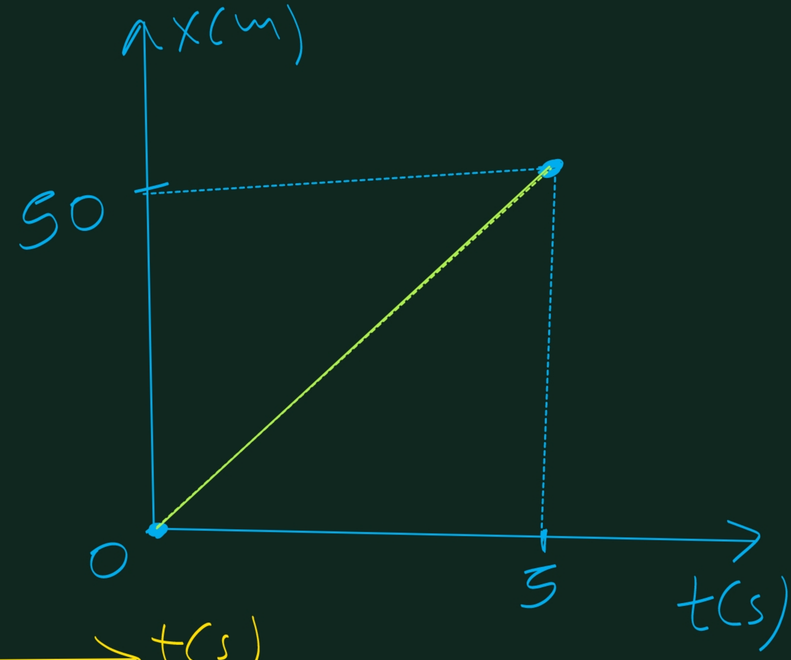
Γενική εξίσωση κίνησης: $X = X_0 + v \cdot t$

X_0 = αρχική θέση.

$X = X_0 + vt$

$X = 0 + 10 \cdot t$ $\Big| \Rightarrow X_0 = 0\,m$, $v = 10\,m/s$.





$S = \Delta X = X$ αν $X_0 = 0$

και το κινητό δεν αλλάξει φορά

Κανονικά: $S = |\Delta X| = |X|$

Άρα: $\Delta X = S = 10 \cdot 5 = 50\,m$

Ασκ. 3.73

$x = 5 + 3t$ (SI)

$x = x_0 + ut$
$x = 5 + 3t$
$\Rightarrow$ $x_0 = 5\,m$ (αρχική θέση)
$u = 3\,m/s$ (ταχύτητα)

α) $u = \frac{\Delta x}{\Delta t} \Rightarrow 3 = \frac{\Delta x}{1} \Rightarrow$

$\Delta x = 3\,m$

ή αλλιώς: $x(0) = x_0 = 5\,m$
$x(1) = 5 + 3 \cdot 1 = 8\,m$
$\Rightarrow \Delta x = x(1) - x(0) = 8 - 5 = 3\,m$

β)