

Άσκηση 1



επίπεδος $d = 66 \text{ cm}$

→ 4 κύκλους / sec
 $v = j$

$$v = \omega \cdot r$$

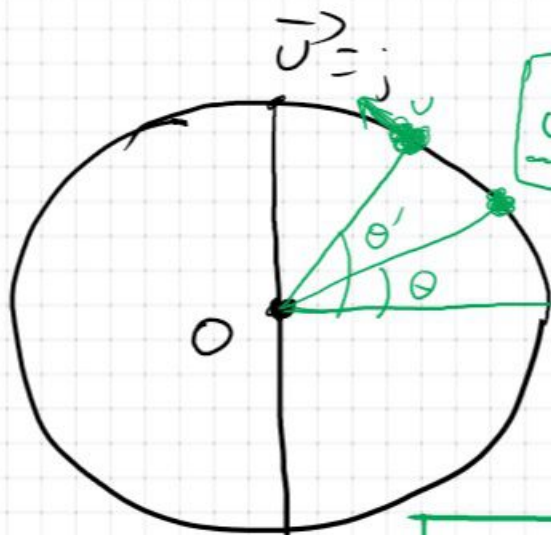
$$\omega = 2\pi f$$

$$f = 4 \text{ Hz}$$

$$\frac{1}{\text{sec}} \rightarrow \text{Hz}$$

Περίοδος $\sim \text{sec}$

Συχν. $\sim \text{Hz}$



$$\omega = \frac{d\theta}{dt}$$

$$\theta = 2t - 3$$

$$\omega = \frac{\Delta\theta}{\Delta t} = \frac{\pi/6 - \pi/8}{4}$$

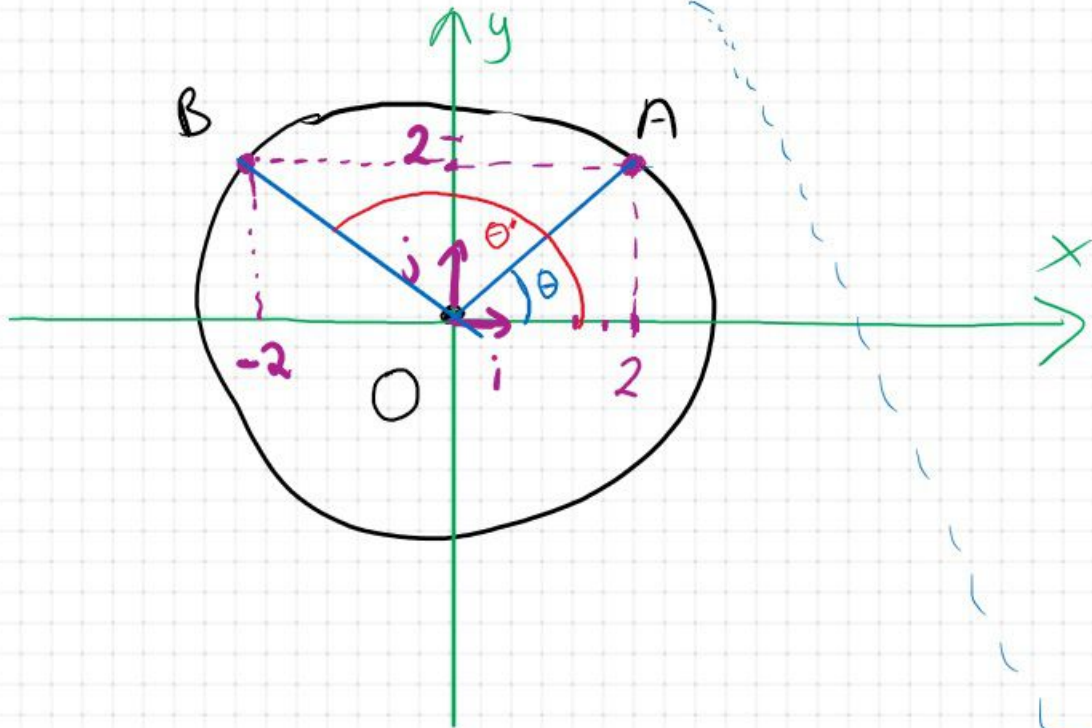
$$v = 2\pi f \cdot r = 2 \cdot 3,14 \cdot 4 \frac{1}{\text{sec}} \cdot 0,33 \text{ m} = 8,29 \text{ m/s} = 8,29 \cdot \frac{0,001 \text{ km}}{\frac{1}{3600} \text{ h}} \approx \underline{\underline{30 \text{ km/h}}}$$

Agung 2

$$A \quad \vec{r}_A = 2\hat{i} + 2\hat{j}$$

$$B \quad \vec{r}_B = -2\hat{i} + 2\hat{j}$$

$$A \rightarrow B : t = 2 \text{ sec}$$



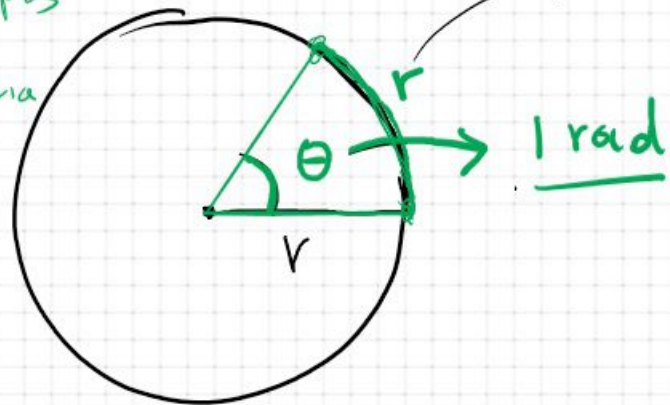
$$xOy \left\{ \begin{array}{l} \sigma_x \in \text{Siang} \text{ za } A/B \\ \bar{\omega} = j \end{array} \right.$$

$$\left\{ \begin{array}{l} \tan \theta = \frac{2}{2} = 1 \quad \theta = \frac{\pi}{4} \\ \tan \theta' = \frac{2}{-2} = -1 \quad \theta' = \frac{3\pi}{4} \end{array} \right\} \rightarrow \Delta \theta = \pi/2$$

$$\bar{\omega} = \frac{\Delta \theta}{\Delta t} \Rightarrow \bar{\omega} = \frac{\pi}{4} \text{ rad/sec}$$

Ακτίνο (rad)

θ → μοίρες
→ ακτίνα



ζόζο
~ μήκος r

{
γιατί;
κίνηση
360°
rad;
}

Μήκος ζόζου	Γωνία
r	1 rad
$2\pi r$	

$$\gamma_{\omega\nu\iota\alpha} = \frac{2\pi r}{r} = 2\pi \quad 360^\circ$$

←

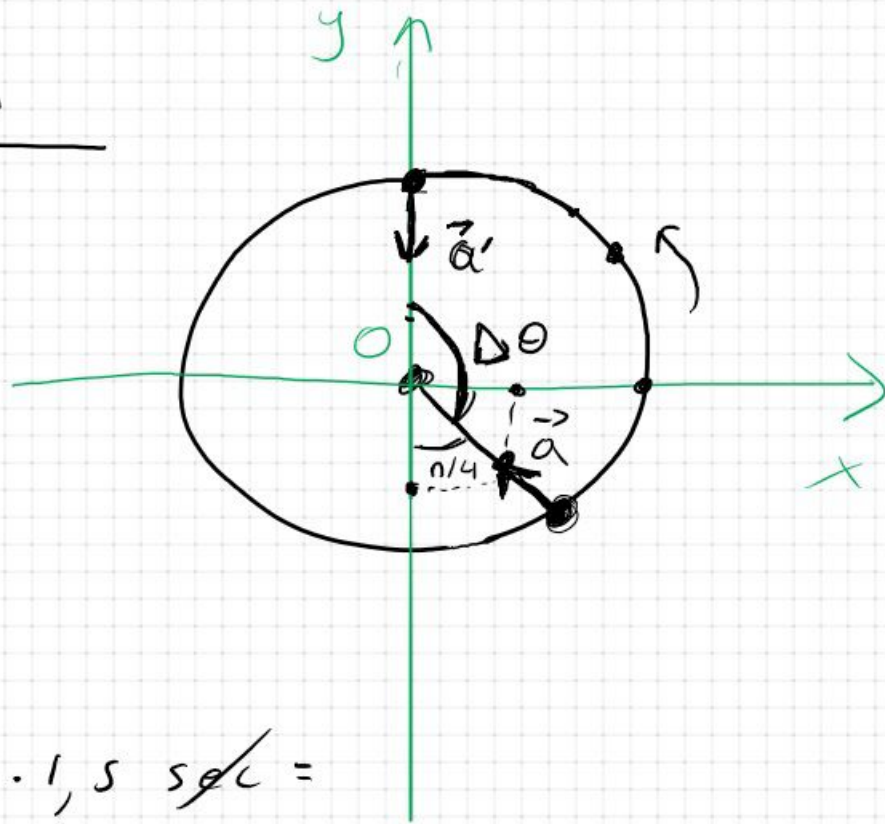
Άσκηση 3

↓
Ομαλή κυκλική κίνηση

$$\rightarrow \omega = \frac{\pi}{2} \text{ rad/s} \quad \times O y \quad \curvearrowright$$

$$A: \rightarrow \vec{a} = 2\hat{i} - 2\hat{j}$$

$a' = ;$ $t = 1,5 \text{ sec}$ μετά την στιγμή A



$$\omega = \frac{\Delta\theta}{\Delta t} \Rightarrow \Delta\theta = \omega \cdot \Delta t = \frac{\pi}{2} \text{ rad/s} \cdot 1,5 \text{ sec} =$$

$$= \frac{\pi}{2} \cdot \frac{3}{2} \text{ rad} = \frac{3\pi}{4} \text{ rad}$$

$$B: \vec{a}' = 2\sqrt{2}\hat{j}$$

$$A: \vec{a} = 2\hat{i} - 2\hat{j}$$

$$|\vec{a}| = \sqrt{2^2 + (-2)^2} = \sqrt{8} = \sqrt{2 \cdot 4} = \underline{\underline{2\sqrt{2}}}$$

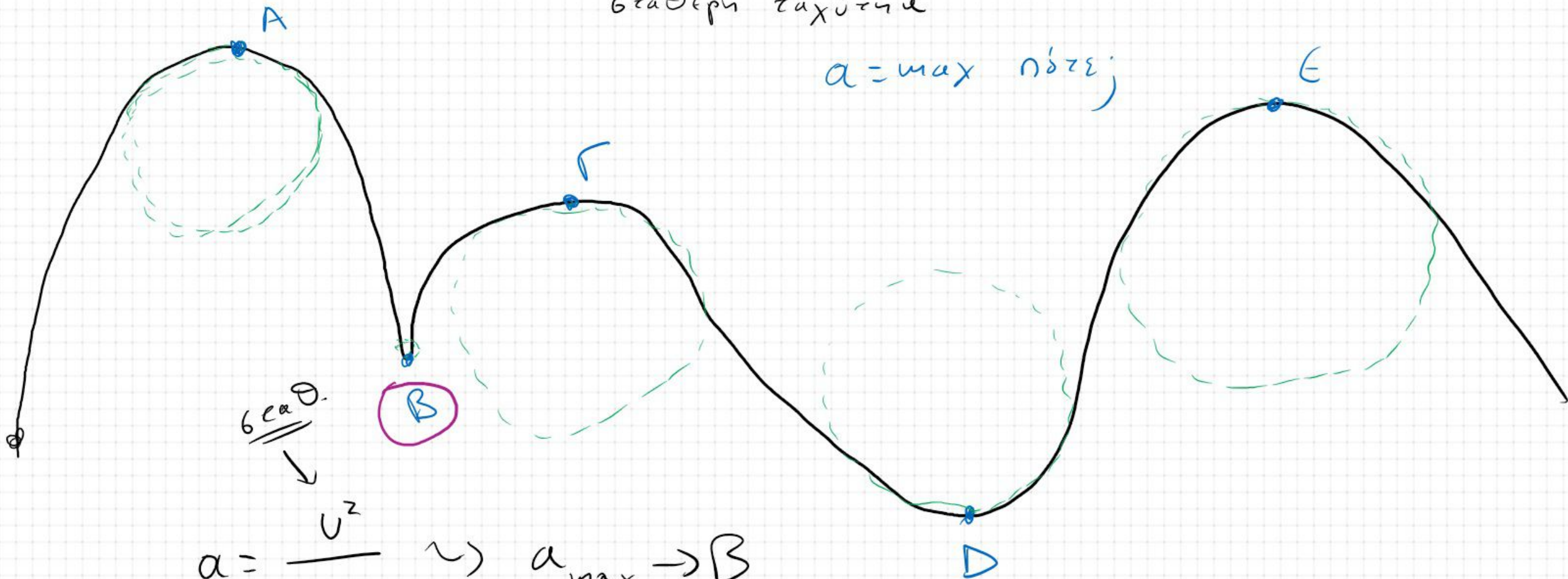


Άσκηση 4



βαθμιαία ταχύτητα

$a = \max$ νόρμης



6 rad/s

$$a = \frac{v^2}{r} \rightsquigarrow a_{\max} \rightarrow B$$

$r \rightarrow \min$

'Ακίνητο S

$$m = 5 \text{ kg}$$

$$F = j$$

$$\Rightarrow k = 2000 \text{ N/m}$$

$$A = j$$

$$t = 0 \rightsquigarrow -5 \text{ cm}$$

$$v_0 = 1 \text{ m/s}$$

* εαδίνωμεν
κωλύμεν κίνηση

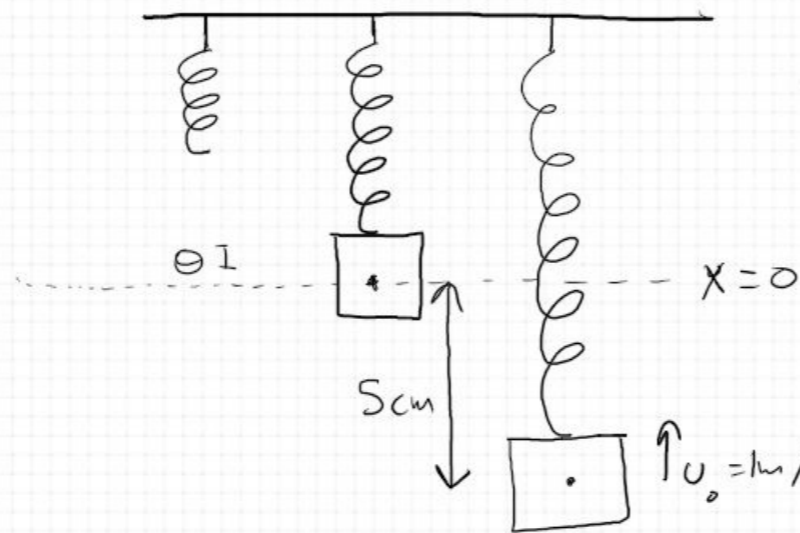
$$\omega = \sqrt{\frac{k}{m}}$$

$$\omega = 2\pi f$$

N \rightarrow

$$F = m \cdot a$$

$$N = \text{kg} \cdot \text{m/s}^2$$



Αproxίως Συνοδικές

$$t = 0 \text{ sec}$$

$$x = -5 \text{ cm} = -0,05 \text{ m}$$

$$v_0 = 1 \text{ m/s}$$

$$\uparrow v_0 = 1 \text{ m/s} \quad x = -5$$

$$T_2 = \frac{1}{\text{sec}}$$

$$2\pi f = \sqrt{\frac{k}{m}} \Rightarrow f = \frac{1}{2\pi} \sqrt{\frac{k}{m}} = \frac{1}{2\pi} \sqrt{\frac{2000 \text{ N/m}}{5 \text{ kg}}} = \frac{1}{2\pi} \sqrt{400 \frac{\text{kg} \cdot \cancel{\text{m}}/\text{s}^2}{\cancel{\text{m}} \cdot \cancel{\text{kg}}}} \Rightarrow$$

$\rightarrow T_2$

$$\Rightarrow f = \frac{1}{2\pi} 20 \cdot \frac{1}{5} \rightsquigarrow \underline{\underline{\frac{10}{\pi} \text{ Hz}}}$$