



Α΄ ΛΥΚΕΙΟΥ
ΑΛΓΕΒΡΑ
ΑΠΑΝΤΗΣΕΙΣ

Θέμα 1^ο

- A. Σχ. Βιβλίο σελ. 38
 B. Σχ. Βιβλίο σελ. 40
 Γ. 1. αν $\theta > 0$ και $|\chi| \leq \theta \Leftrightarrow -\theta \leq \chi \leq \theta$
 2. $|\chi| = |\alpha| \Leftrightarrow \chi = \alpha$ ή $\chi = -\alpha$
 Δ. 1. Λ
 2. Λ
 3. Σ
 4. Λ
 5. Σ

Θέμα 2^ο

$$D = \begin{vmatrix} 2 & -1 \\ -1 & 3 \end{vmatrix} = 2 \cdot 3 - (-1)(-1) = 6 - 1 = 5$$

$$D_x = \begin{vmatrix} 1 & -1 \\ \lambda & 3 \end{vmatrix} = 1 \cdot 3 - (-1)\lambda = 3 + \lambda$$

$$D_y = \begin{vmatrix} 2 & 1 \\ -1 & \lambda \end{vmatrix} = 2\lambda - (-1)1 = 2\lambda + 1$$

- B. Επειδή $D \neq 0$ το σύστημα έχει μοναδική λύση την:

$$\begin{cases} x = \frac{D_x}{D} = \frac{3 + \lambda}{5} \\ y = \frac{D_y}{D} = \frac{2\lambda + 1}{5} \end{cases}$$

Θέμα 3^ο

$$\text{A. } \begin{aligned} 3|x-1|-2 \leq 2|1-x| &\Leftrightarrow 3|x-1|-2|x-1| \leq 2 \Leftrightarrow \\ &\Leftrightarrow |x-1| \leq 2 \Leftrightarrow -2 \leq x-1 \leq 2 \Leftrightarrow -1 \leq x \leq 3 \end{aligned}$$

$$\text{B. } \left. \begin{aligned} (x-1)^4 - 3(x-1)^2 - 4 = 0 \\ \text{θετ} \omega : (x-1)^2 = \omega, \omega \geq 0 \end{aligned} \right\} \omega^2 - 3\omega - 4 = 0 \begin{cases} \omega = -1 \\ \omega = 4 \end{cases} \text{ (ΑΠΟΡΡΙΠΤΕΤΑΙ)}$$

$$\text{Άρα } (x-1)^2 = 4 \Rightarrow \begin{cases} x-1=2 \\ \eta' \\ x-1=-2 \end{cases} \Rightarrow \begin{cases} x=3 \\ \eta' \\ x=-1 \end{cases}$$

$$\begin{aligned} \text{Γ. } \frac{\sqrt{3}}{\sqrt{3}-\sqrt{2}} - \frac{\sqrt{2}}{\sqrt{3}+\sqrt{2}} &= \frac{\sqrt{3}(\sqrt{3}+\sqrt{2})}{(\sqrt{3}-\sqrt{2})(\sqrt{3}+\sqrt{2})} - \frac{\sqrt{2}(\sqrt{3}-\sqrt{2})}{(\sqrt{3}+\sqrt{2})(\sqrt{3}-\sqrt{2})} = \frac{3+\sqrt{3}\sqrt{2}}{1} - \frac{\sqrt{3}\sqrt{2}-2}{1} = \\ &= 3 + \sqrt{3}\sqrt{2} - (\sqrt{3}\sqrt{2} - 2) = 3 + \cancel{\sqrt{3}\sqrt{2}} - \cancel{\sqrt{3}\sqrt{2}} + 2 = 3 + 2 = 5 \end{aligned}$$

Θέμα 4^ο

$$\lambda_{\varepsilon_1} \cdot \lambda_{\varepsilon_2} = -1 \Leftrightarrow (2|\alpha|-1)\left(-\frac{1}{3}\right) = -1 \Leftrightarrow 2|\alpha|-1 = 3 \Leftrightarrow 2|\alpha| = 4 \Leftrightarrow$$

$$\text{A. } \Leftrightarrow |\alpha| = 2 \Leftrightarrow \begin{cases} \alpha = 2 \\ \eta' \\ \alpha = -2 \end{cases}$$

B. 1.

$$\left. \begin{aligned} (\varepsilon_1): y = 3x + 3 \\ (\varepsilon_2): y = -\frac{1}{3}x - \frac{1}{3} \end{aligned} \right\} \Leftrightarrow \begin{cases} 3x + 3 = -\frac{1}{3}x - \frac{1}{3} \Leftrightarrow 9x + 9 = -x - 1 \Leftrightarrow 10x = -10 \Leftrightarrow x = -1 \\ y = 3(-1) + 3 \Rightarrow y = -\cancel{\beta} + \cancel{\beta} \Rightarrow y = 0 \end{cases}$$

Άρα το σημείο τομής των ε_1 και ε_2 είναι το $A(-1,0)$

B.2.

$$d(AO) = \sqrt{(X_A - X_O)^2 + (\Psi_A - \Psi_O)^2} = \sqrt{(-1-0)^2 + (0-0)^2} = \sqrt{1} = 1 \Rightarrow d(AO) = 1$$

B.3. Αρκεί $f(-1) = 0 \Leftrightarrow (-1)^2 + \lambda(-1) - 1 = 0 \Leftrightarrow \lambda - \lambda - \lambda = 0 \Leftrightarrow \lambda = 0$

B.4. Για $\lambda=0$ $f(x) = x^2 - 1$

$$\text{Αρκεί } f(x) > 0 \Leftrightarrow x^2 - 1 > 0 \Leftrightarrow x^2 > 1 \Leftrightarrow |x|^2 > 1^2 \Leftrightarrow \begin{cases} x < -1 \\ \eta' \\ x > 1 \end{cases}$$