



## Α΄ ΛΥΚΕΙΟΥ ΑΛΓΕΒΡΑ

### ΑΠΑΝΤΗΣΕΙΣ

#### Θέμα 1<sup>ο</sup>

- 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<sup>ο</sup>

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

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

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

- 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<sup>ο</sup>**

A.  $3|x-1|-2 \leq 2|1-x| \Leftrightarrow 3|x-1|-2|x-1| \leq 2 \Leftrightarrow$   
 $\Leftrightarrow |x-1| \leq 2 \Leftrightarrow -2 \leq x-1 \leq 2 \Leftrightarrow -1 \leq x \leq 3$

B.  $(x-1)^4 - 3(x-1)^2 - 4 = 0$   
 θεω  $(x-1)^2 = \omega, \omega \geq 0$   $\left. \begin{array}{l} \omega^2 - 3\omega - 4 = 0 \\ \omega = -1 \text{ (ΑΠΟΡΡΙΠΤΕΤΑΙ)} \\ \omega = 4 \end{array} \right\}$

άρα  $(x-1)^2 = 4 \Rightarrow \left\{ \begin{array}{l} x-1=2 \\ \eta' \\ x-1=-2 \end{array} \right\} \Rightarrow \left\{ \begin{array}{l} x=3 \\ \eta' \\ x=-1 \end{array} \right.$

Γ.  $\frac{\sqrt{3}}{\sqrt{3}-\sqrt{2}} - \frac{\sqrt{2}}{\sqrt{3}+\sqrt{2}} = \frac{\sqrt{3}(\sqrt{3}+\sqrt{2})}{(\sqrt{3}-\sqrt{2})(\sqrt{3}+\sqrt{2})} - \frac{\sqrt{2}(\sqrt{3}-\sqrt{2})}{(\sqrt{3}+\sqrt{2})(\sqrt{3}-\sqrt{2})} = \frac{3+\sqrt{3}\sqrt{2}}{1} - \frac{\sqrt{3}\sqrt{2}-2}{1} =$   
 $= 3 + \sqrt{3}\sqrt{2} - (\sqrt{3}\sqrt{2} - 2) = 3 + \sqrt{3}\sqrt{2} - \sqrt{3}\sqrt{2} + 2 = 3 + 2 = 5$

**Θέμα 4<sup>ο</sup>**

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

A.  $\Leftrightarrow |\alpha| = 2 \Leftrightarrow \left\{ \begin{array}{l} \alpha = 2 \\ \eta' \\ \alpha = -2 \end{array} \right.$

B. 1.

$(\varepsilon_1): y = 3x + 3$   
 $(\varepsilon_2): y = -\frac{1}{3}x - \frac{1}{3}$   
 $3x + 3 = -\frac{1}{3}x - \frac{1}{3} \Leftrightarrow 9x + 9 = -x - 1 \Leftrightarrow 10x = -10 \Leftrightarrow x = -1$   
 $y = 3(-1) + 3 \Rightarrow y = -\cancel{3} + \cancel{3} \Rightarrow y = 0$

Άρα το σημείο τομής των  $\varepsilon_1$  και  $\varepsilon_2$  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  $\lambda=0$   $f(x) = x^2 - 1$

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

ΘΕΜΑΤΑ 2007