

ΤΡΙΤΗ 18 ΜΑΪΟΥ 2010  
ΜΑΘΗΜΑΤΙΚΑ ΕΣΠΕΡΙΝΩΝ ΛΥΚΕΙΩΝ  
ΕΝΔΕΙΚΤΙΚΕΣ ΑΠΑΝΤΗΣΕΙΣ

**ΘΕΜΑ Α**

**A1.** θεωρία σχολικού σελ. 28

**A2.** θεωρία σχολικού σελ 16

**A3. α.** Σ

Β. Λ

Γ. Λ

Δ. Λ

Ε. Λ

**ΘΕΜΑ Β**

**B1.**  $\delta = 3,5 = \frac{4+3}{2}$

$$\underbrace{2,2,\dots,2}_{10} \underbrace{3,3,\dots,3}_a \underbrace{4,4,\dots,4}_{10} \underbrace{5,5,\dots,5}_{10} \underbrace{6,6,\dots,6}_{20}$$

$$10 + 4 = 40 \Rightarrow a = 30$$

**B2.**  $\bar{x} = \frac{\sum x_i \cdot v_i}{x} = \frac{2 \cdot 1 + 3 \cdot 30 + 4 \cdot 10 + 5 \cdot 10 + 6 \cdot 20}{80} = \frac{20 + 90 + 40 + 50 + 120}{80} = \frac{320}{80} = 4$

**B3.**

$$S^2 = \frac{(2-4)^2 \cdot 10 + (3-4)^2 \cdot 30 + (4-4)^2 \cdot 10 + (5-4)^2 \cdot 10 + (6-4)^2 \cdot 20}{80} = \frac{40 + 30 + 0 + 10 + 80}{80} = \frac{160}{80} = 2$$

**ΘΕΜΑ Γ**

$$f(x) = x^3 + ax^2 - 9x + \beta, \quad x \in \mathbb{R}$$

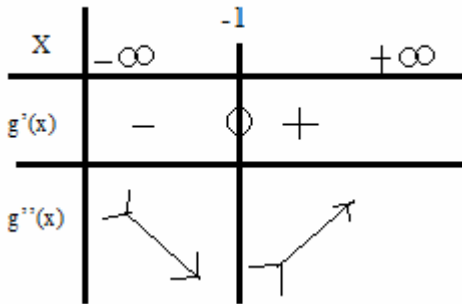
**Γ1.**  $\left. \begin{array}{l} \lambda = f'(2) = 15 \\ f(2) = 5 \end{array} \right\} \Rightarrow \begin{cases} 3 \cdot 2^2 + 2a \cdot 2 - 9 = 15 \Rightarrow 12 + 4a - 9 = 15 \Rightarrow 4a = 12 \Rightarrow a = 3 \\ 2^3 + 3 \cdot 2^2 - 9 \cdot 2 + \beta = 5 \Rightarrow 8 + 12 - 18 + \beta = 5 \Rightarrow \beta + 2 = 5 \Rightarrow \beta = 3 \end{cases}$

**Γ2.**

$$f(x) = x^3 + 3x^2 - 9x + 3$$

$$\lim_{x \rightarrow 2} \frac{f'(x) + 9}{x^2 - 4} = \lim_{x \rightarrow 2} \frac{3x^2 + 6x - 9 + 9}{x^2 - 4} = \lim_{x \rightarrow 2} \frac{3x(x+2)}{(x+2)(x-2)} = \frac{3(-2)}{-4} = \frac{-6}{-4} = \frac{3}{2}$$

**Γ3.**



$$g(x) = f'(x) + 10 = 3x^2 + 6x - 9 + 10 = 3x^2 + 6x + 1$$

$$Ag = \mathbb{R}$$

$$g'(x) = 6x + 6$$

$$g'(x) = 0 \Rightarrow 6x + 6 = 0 \Rightarrow 6x = -6 \Rightarrow x = -1$$

### ΘΕΜΑ Δ

$$x_1 = a, x_2 = a + 5, x_3 = a + 10, x_4 = a + 35$$

$$F_i = \frac{7i - 3}{\lambda} \quad F_4 = \frac{7 \cdot 4 - 3}{\lambda} = \frac{25}{\lambda}$$

**Δ1.**

$$F_4 = f_1 + f_2 + f_3 + f_4 = 1 \Rightarrow \frac{25}{\lambda} = 1 \Rightarrow \lambda = 25$$

**Δ2.**

$$F_1 = f_1 = \frac{7 \cdot 1 - 3}{25} = \frac{4}{25}$$

$$F_2 = f_1 + f_2 \Rightarrow \frac{7 \cdot 2 - 3}{25} = \frac{4}{25} + f_2 \Rightarrow \frac{11}{25} - \frac{4}{25} = f_2 \Rightarrow f_2 = \frac{7}{25}$$

$$F_3 = F_2 + f_3 \Rightarrow \frac{7 \cdot 3 - 3}{25} = \frac{11}{25} + f_3 \Rightarrow \frac{18}{25} = \frac{11}{25} + f_3 \Rightarrow f_3 = \frac{7}{25}$$

$$F_4 = 1 = F_3 + f_4 \Rightarrow 1 = \frac{18}{25} + f_4 \Rightarrow f_4 = \frac{7}{25}$$

**Δ3.**

$$\bar{x} = \sum x_i f_i \Rightarrow 19 = \frac{4a}{25} + \frac{7}{25}(a+5) + \frac{7}{25}(a+10) + \frac{7}{25}(a+35) \Rightarrow 19 = \frac{4a}{25} + \frac{7}{25}(a+5+a+10+a+35) \Rightarrow$$

$$19 = \frac{4a}{25} + \frac{7}{25}(3a+50) \Rightarrow$$

$$19 \cdot 25 = 4a + 7(3a+50) \Rightarrow$$

$$19 \cdot 25 = 4a + 21a + 7 \cdot 50 \Rightarrow$$

$$19 \cdot 25 = 25a + 7 \cdot 50 \Rightarrow$$

$$19 = a + 7 \cdot 2 \Rightarrow$$

$$19 = a + 14$$

$$a = 5$$

ΕΠΙΜΕΛΕΙΑ  
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