ΕΠΑ.Λ (ΟΜΑΔΑ Α') – ΕΣΠΕΡΙΝΑ

ΛΥΣΕΙΣ

ΘΕΜΑ Α

Α1) Θεωρία Σχ. Βιβλίου

Α2) α) Σ β) Σ γ) Λ δ) Σ ε) Λ

Α3) 1.(α) 2.(β) 3.(β)

Α4)

α) $c \cdot f'(x)$

β) $g'(f(x)) \cdot f'(x)$

ΘΕΜΑ Β

Β1)

x_i	v_i	$f_i\%$	$x_i \cdot v_i$
5	3	15	15
6	5	25	30
7	3	15	21
8	7	35	56
9	2	10	18
ΣΥΝΟΛΑ	20	100	140

Β2) $\bar{x} = \frac{\Sigma x_i v_i}{v} = \frac{140}{20} = 7$

Β3) $M_o = 8$

Β4) $\delta = \frac{x_{10} + x_{11}}{2} = \frac{7+7}{2} = 7$

Β5) $f_4 + f_5 = 35 + 10 = 45\%$

ΘΕΜΑ Γ

Γ1) $\lim_{x \to 1^-} f(x) = \frac{2}{k}$, $\lim_{x \to 1^+} f(x) = 1 + k$, $f(1) = 1 + k$

Αρκεί και πρέπει $\frac{2}{k} = 1 + k \rightsquigarrow k^2 + k = 2 \rightsquigarrow k^2 + k - 2 = 0$

$\Delta = 1 - 4(-2) = 9$

$k_{1,2} = \frac{-1 \pm 3}{2}$ → $k_1 = 1$, $k_2 = -2$

Γ2

$$f(x)=x^2+1 \quad , \quad f'(x)=2x \quad ,$$

Γ3

$$A=50^2+1-2\cdot 245+1=2500+1-490+1$$
$$=2012$$

Γ4

$$\int_0^2 f(x)\,dx=\int_0^1 f(x)\,dx+\int_1^2 f(x)\,dx=$$
$$=\int_0^1 2x\,dx+\int_1^2 (x^2+1)\,dx=2\left[\frac{x^2}{2}\right]_0^1+\left[\frac{x^3}{3}\right]_1^2+(2-1)$$
$$=2\cdot\frac{1}{2}+\left(\frac{8}{3}-\frac{1}{3}\right)+1=1+\frac{7}{3}+1=2+\frac{7}{3}=\frac{13}{3}$$

ΘΕΜΑ Δ

Δ1 $f'(3)=0 \rightsquigarrow 3^2+\lambda\cdot 3-6=0 \rightsquigarrow 9+3\lambda-6=0 \rightsquigarrow \boxed{\lambda=-1}$

Δ2

$f'(x)=x^2-x-6$, $f'(x)=0 \rightsquigarrow \Delta=(-1)^2-4\cdot 1\cdot(-6)=25$

$$x_{1,2}=\frac{1\pm 5}{2} \quad \begin{cases} x_1=3 \\ x_2=-2 \end{cases}$$

		-2		3	
$f'(x)$	$+$	0	$-$	0	$+$
$f(x)$	↗	T.M	↘	T.E	↗

για $x_1=3$ T.E

για $x_2=-2$ T.M

Δ3

$$\lim_{x\to 3}\frac{x^2-x-6}{\sqrt{x}-\sqrt{3}}\overset{\left(\frac{0}{0}\right)}{=}\lim_{x\to 3}\frac{(x-3)(x+2)(\sqrt{x}+\sqrt{3})}{(\sqrt{x})^2-(\sqrt{3})^2}=\lim_{x\to 3}\frac{\cancel{(x-3)}(x+2)(\sqrt{x}+\sqrt{3})}{\cancel{x-3}}=$$
$$=(3+2)\cdot(\sqrt{3}+\sqrt{3})=6\cdot 2\sqrt{3}=12\cdot\sqrt{3}.$$