

Γ ΛΥΚΕΙΟΥ ΜΕΡΟΣ Α

15.35 1)

Είναι $f'(x) = \alpha e^{x^2-x} (2x-1) + \beta$, οπότε

$$f(1) = 3 \Rightarrow \alpha e^{1^2-1} + \beta \cdot 1 = 3 \Rightarrow \boxed{\alpha + \beta = 3} \quad (1)$$

$$f'(0) = 1 \Rightarrow \alpha e^{0^2-0} (2 \cdot 0 - 1) + \beta = 1 \Rightarrow \alpha(-1) + \beta = 1 \Rightarrow \boxed{-\alpha + \beta = 1} \quad (2)$$

Λύνοντας το σύστημα των (1) και (2) βρίσκουμε $\boxed{\alpha = 1}$ και $\boxed{\beta = 2}$

15.35 2)

Είναι $f'(x) = 3x^2 + 2\alpha x + \beta$, οπότε

$$f(1) = 2 \Rightarrow 1^3 + \alpha \cdot 1^2 + \beta \cdot 1 - 4 = 2 \Rightarrow 1 + \alpha + \beta - 4 = 2 \Rightarrow \alpha + \beta = 5 \quad (1)$$

$$f'(-2) = 7 \Rightarrow 3 \cdot (-2)^2 + 2\alpha \cdot (-2) + \beta = 7 \Rightarrow 12 - 4\alpha + \beta = 7 \Rightarrow -4\alpha + \beta = -5 \quad (2)$$

Λύνοντας το σύστημα των (1) και (2) βρίσκουμε $\boxed{\alpha = 2}$ και $\boxed{\beta = 3}$

15.35 3)

Είναι $f'(x) = \frac{\alpha}{2\sqrt{x}} + \frac{\beta}{x}$, οπότε

$$f(1) = 2 \Rightarrow \alpha\sqrt{1} + \beta \ln 1 = 2 \Rightarrow \boxed{\alpha = 2}$$

$$f'(1) = 2 \Rightarrow \frac{\alpha}{2\sqrt{1}} + \frac{\beta}{1} = 2 \Rightarrow \frac{\alpha}{2} + \beta = 2 \xRightarrow{\alpha=2} 1 + \beta = 2 \Rightarrow \boxed{\beta = 1}$$

15.35 4)

Είναι $f'(x) = 4\alpha x^3 + 3\beta x^2 + 6x + 6$ και $f''(x) = 12\alpha x^2 + 6\beta x + 6$, οπότε

$$\begin{aligned} f'(-1) &= -10 \Rightarrow 4\alpha(-1)^3 + 3\beta(-1)^2 + 6(-1) + 6 = -10 \Rightarrow \\ &\Rightarrow -4\alpha + 3\beta - 6 + 6 = -10 \Rightarrow -4\alpha + 3\beta = -10 \quad (1) \end{aligned}$$

$$f''(1) = 6 \Rightarrow 12\alpha \cdot 1^2 + 6\beta \cdot 1 + 6 = 6 \Rightarrow 12\alpha + 6\beta + 6 = 6 \Rightarrow 12\alpha + 6\beta = 0 \Rightarrow 2\alpha + \beta = 0 \quad (2)$$

Λύνοντας το σύστημα των (1) και (2) βρίσκουμε $\boxed{\alpha = 1}$ και $\boxed{\beta = -2}$