

Γ ΛΥΚΕΙΟΥ ΜΕΡΟΣ Α

15.31 1)

$$f(x) = x^4 - x^3 - x^2 + 4x - 1 \Rightarrow f'(x) = 4x^3 - 3x^2 - 2x + 4 \Rightarrow f''(x) = 12x^2 - 6x - 2$$

$$\text{Άρα } f''(-1) = 12(-1)^2 - 6(-1) - 2 \Rightarrow f''(-1) = 12 + 6 - 2 \Rightarrow f''(-1) = 16$$

15.31 2)

$$f'(x) = 3x^2 - 4x + 5 \Rightarrow f''(x) = 6x - 4$$

$$\text{Άρα } f''(2) = 6 \cdot 2 - 4 = 12 - 4 = \boxed{8}$$

15.31 3)

$$f(x) = x^2 \ln x \Rightarrow f'(x) = 2x \ln x + x^{\cancel{2}} \frac{1}{\cancel{x}} \Rightarrow f'(x) = 2x \ln x + x \Rightarrow$$

$$\Rightarrow f''(x) = 2 \ln x + 2 \cancel{x} \frac{1}{\cancel{x}} + 1 = 2 \ln x + 3$$

$$\text{Άρα } f''(e) = 2 \ln e + 3 = 2 + 3 = \boxed{5}$$

15.31 4)

$$f(x) = e^x \eta \mu x \Rightarrow f'(x) = e^x \eta \mu x + e^x \sigma \upsilon \nu x \Rightarrow$$

$$\Rightarrow f''(x) = \cancel{e^x \eta \mu x} + e^x \sigma \upsilon \nu x + e^x \sigma \upsilon \nu x - \cancel{e^x \eta \mu x} \Rightarrow f''(x) = 2e^x \sigma \upsilon \nu x \Rightarrow$$

$$\Rightarrow f''(0) = 2e^0 \sigma \upsilon \nu 0 \Rightarrow f''(0) = 2$$