

Γ ΛΥΚΕΙΟΥ ΜΕΡΟΣ Α

14.7 1)

$$f(3+h) = h^2 + h - 1 \xrightarrow{h=0} f(3+0) = 0^2 + 0 - 1 \Rightarrow \boxed{f(3) = -1}$$

Ακόμη

$$\boxed{f'(3)} = \lim_{h \rightarrow 0} \frac{f(3+h) - f(3)}{h} = \lim_{h \rightarrow 0} \frac{h^2 + h - 1 - (-1)}{h} = \lim_{h \rightarrow 0} \frac{h^2 + h}{h} = \lim_{h \rightarrow 0} (h + 1) = 0 + 1 = \boxed{1}$$

$$\text{Άρα } \boxed{f(3) + f'(3)} = -1 + 1 = \boxed{0}$$

14.7 2)

$$\alpha) f(1+h) = 2h^2 - h + 2 \xrightarrow{h=0} f(1+0) = 2 \cdot 0^2 - 0 + 2 \Rightarrow \boxed{f(1) = 2}$$

$$\begin{aligned} \beta) \boxed{f'(1)} &= \lim_{h \rightarrow 0} \frac{f(1+h) - f(1)}{h} = \lim_{h \rightarrow 0} \frac{2h^2 - h + 2 - 2}{h} = \\ &= \lim_{h \rightarrow 0} \frac{2h^2 - h}{h} = \lim_{h \rightarrow 0} (2h - 1) = 0 - 1 = \boxed{-1} \end{aligned}$$

14.7 3)

$$\alpha) f(2+h) = h^2 - 2h - 3 \xrightarrow{h=0} f(2+0) = 0^2 - 2 \cdot 0 - 3 \Rightarrow \boxed{f(2) = -3}$$

$$\begin{aligned} \beta) \boxed{f'(2)} &= \lim_{h \rightarrow 0} \frac{f(2+h) - f(2)}{h} = \lim_{h \rightarrow 0} \frac{h^2 - 2h - 3 - (-3)}{h} = \\ &= \lim_{h \rightarrow 0} \frac{h^2 - 2h}{h} = \lim_{h \rightarrow 0} (h - 2) = 0 - 2 = \boxed{-2} \end{aligned}$$

14.7 4)

$$f(-5+h) = \frac{1-h}{2} + h^2 - h^3 \xrightarrow{h=0} f(-5+0) = \frac{1-0}{2} + 0^2 - 0^3 \Rightarrow \boxed{f(-5) = \frac{1}{2}}$$

Ακόμη

$$\begin{aligned} \boxed{f'(-5)} &= \lim_{h \rightarrow 0} \frac{f(-5+h) - f(-5)}{h} = \lim_{h \rightarrow 0} \frac{\frac{1-h}{2} + h^2 - h^3 - \frac{1}{2}}{h} = \\ &= \lim_{h \rightarrow 0} \frac{-\frac{h}{2} + h^2 - h^3}{h} = \lim_{h \rightarrow 0} \frac{-\frac{1}{2} + h - h^2}{1} = \boxed{-\frac{1}{2}} \end{aligned}$$

$$\text{Άρα } \boxed{f(-5) + f'(-5)} = \frac{1}{2} - \frac{1}{2} = \boxed{0}$$

14.7 5)

$$f(6+h) = 1933 + h - 3h^2 + h^5 \xrightarrow{h=0} f(6+0) = 1933 + 0 - 3 \cdot 0^2 + 0^5 \Rightarrow \boxed{f(6) = 1933}$$

Ακόμη

$$\begin{aligned}
 \boxed{f'(6)} &= \lim_{h \rightarrow 0} \frac{f(6+h) - \overset{f(6+h)=1933+h-3h^2+h^5}{\underset{f(6)=1933}{f(6)}}}{h} = \lim_{h \rightarrow 0} \frac{\cancel{1933} + h - 3h^2 + h^5 - \cancel{1933}}{h} = \\
 &= \lim_{h \rightarrow 0} \frac{\cancel{h} (1 - 3h + h^4)}{\cancel{h}} = \boxed{1}
 \end{aligned}$$

$$\text{Αρα } \boxed{f(6)} = 1933 = 1933 \cdot 1 = \boxed{1933f'(6)}$$