

14.36

$$\begin{aligned} \lim_{h \rightarrow 0} \frac{f^2(x_0 + h) - f^2(x_0)}{h} &= \lim_{h \rightarrow 0} \frac{[f(x_0 + h) - f(x_0)][f(x_0 + h) + f(x_0)]}{h} = \\ &= \lim_{h \rightarrow 0} [f(x_0 + h) + f(x_0)] \cdot \lim_{h \rightarrow 0} \frac{f(x_0 + h) - f(x_0)}{h} = \end{aligned}$$

$$\begin{aligned} \lim_{h \rightarrow 0} \frac{f(x_0 + h) - f(x_0)}{h} &= f'(x_0) \\ \lim_{h \rightarrow 0} f(x_0 + h) &= f(x_0) \text{ (διότι } f \text{ παραγωγίσιμη, άρα συνεχής)} \\ &= \boxed{2f(x_0) \cdot f'(x_0)} \end{aligned}$$