$\boxed{2.8.4}$ 2MR

On a $\displaystyle\lim_{h \to 0^{>}} \frac{f(0+h) - f(0)}{h} = \lim_{h \to 0^{>}} \frac{0}{h} = 0$

De plus, $\displaystyle\lim_{h \to 0^{<}} \frac{f(0+h) - f(0)}{h} =$

$$\lim_{h \to 0^{<}} \frac{h^2 \cdot \sin\left(\frac{1}{h}\right)}{h} = \lim_{h \to 0^{<}} h \cdot \sin\left(\frac{1}{h}\right)$$

Or, $h \cdot -1 \geq h \cdot \sin\left(\frac{1}{h}\right) \geq h \cdot 1 \quad \forall h < 0$

$$\Rightarrow \quad \underset{\downarrow \atop 0}{h} \leq \underset{\downarrow \atop 0}{h \cdot \sin\left(\frac{1}{h}\right)} \leq \underset{\downarrow \atop 0}{-h} \quad h \to 0$$

$$\boxed{2.8.4}_2$$

2MR

On a donc $\lim\limits_{h \overset{<}{\to} 0} \dfrac{f(0+h)-f(0)}{h} = 0$,

ce qui fait que

$$\lim_{h \overset{>}{\to} 0} \frac{f(0+h)-f(0)}{h} = \lim_{h \overset{<}{\to} 0} \frac{f(0+h)-f(0)}{h} = 0$$

$\Rightarrow$ $f'(0)$ existe et vaut zero.