

Exercice 4.1.

a) de côté

b) $f(x) = x^2 - x$, $a = -1$

• Méthode 1 :

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

• Méthode 2 :

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