

Rappel dérivée

a)

$$\begin{array}{l} f(x) = 3 \\ f(x) = 3x \\ f(x) = x^2 \\ f(x) = 3x^2 \end{array} \quad \begin{array}{l} f'(x) = 0 \\ f'(x) = 3 \\ f'(x) = 2x \\ f'(x) = 6x \end{array}$$

$$\begin{array}{l} (k)' = 0 \\ (k \cdot u)' = k \cdot u' \\ (x^n)' = n x^{n-1} \end{array} \quad \begin{array}{l} k \text{ une constante} \\ u \text{ une fonction de } x \end{array}$$

b)

$$(u+v)' = u' + v' \quad u, v \text{ des fcts de } x$$

$$\begin{array}{l} f(x) = 3x^2 + x + 10 \\ f(x) = \frac{1}{5}x^5 + \frac{3}{2}x^3 - x \end{array} \quad \begin{array}{l} f'(x) = 6x + 1 \quad (+0) \\ f'(x) = \frac{1}{5} \cdot 5x^4 + \frac{3}{2} \cdot 3x^2 - 1 = x^4 + \frac{9}{2}x^2 - 1 \end{array}$$

c)

$$(u \cdot v)' = \underbrace{u'}_u v + u \underbrace{v'}_v$$

$$f(x) = 3x \left(\frac{1}{5}x^5 + \frac{3}{2}x^3 - x \right)$$

$$f'(x) = 3 \left(\frac{1}{5}x^5 + \frac{3}{2}x^3 - x \right) + 3x \left(x^4 + \frac{9}{2}x^2 - 1 \right)$$

d)

$$\left(\frac{u}{v} \right)' = \frac{u'v - uv'}{v^2}$$

$$f(x) = \frac{3x}{\frac{1}{5}x^5 + \frac{3}{2}x^3 - x}$$

$$u = 3x \rightarrow u' = 3$$

$$v = \frac{1}{5}x^5 + \dots \rightarrow v' = x^4 + \dots$$

$$f'(x) = \frac{3 \left(\frac{1}{5}x^5 + \frac{3}{2}x^3 - x \right) - 3x \left(x^4 + \frac{9}{2}x^2 - 1 \right)}{\left(\frac{1}{5}x^5 + \frac{3}{2}x^3 - x \right)^2}$$

e)

$$\boxed{(u^n)' = n \cdot u^{n-1} \cdot \underbrace{u'}_{\text{dérivée interne}}}$$

$$f(x) = (2x-1)^3$$

$$f'(x) = 3(2x-1)^2 \cdot 2 = 6(2x-1)^2$$

cas particulier : $(\sqrt{u})' = \frac{u'}{2\sqrt{u}}$

$$f(x) = \sqrt{2x-6}$$

$$f'(x) = \frac{2}{2\sqrt{2x-6}} = \frac{1}{\sqrt{2x-6}}$$