Rappels : Dérivée

Règles

a)
$f(x) = 3$ $\quad f'(x) = 0$

$f(x) = 3x$ $\quad f'(x) = 3$

$f(x) = x^2$ $\quad f'(x) = 2x$

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

$f(x) = x^5$ $\quad f'(x) = 5x^4$

$k' = 0$ avec $k \in \mathbb{R}$, constante

$(ku)' = k\cdot u'$ avec u une fct de x

$(x^n)' = n\cdot x^{n-1}$

b)
$f(x) = 2x+1$ $\quad f'(x) = 2 \ (+0)$

$f(x) = 3x^2+x+1$ $\quad f'(x) = 6x+1$

$(u+v)' = u' + v'$, u et v des fcts de x

c) • $f(x) = (2x+1)(3x^2+x+1)$

$(u\cdot v)' = u'v + uv'$ ⚠

$f'(x) = 2(3x^2+x+1) + (2x+1)(6x+1) = \dots$

• $f(x) = (x^2-1)(2x-3)$

$u = x^2-1 \qquad v = 2x-3$

$u' = 2x \qquad v' = 2$

$f'(x) = 2x(2x-3) + 2(x^2-1) = \dots$

d) $f(x) = \dfrac{2x+1}{3x^2+x+1}$

$f'(x) = \dfrac{2(3x^2+x+1) - (2x+1)(6x+1)}{(3x^2+x+1)^2} = \dots$

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

cas particulier : $\left(\dfrac{1}{v}\right)' = -\dfrac{v'}{v^2}$

e) • $f(x) = (2x+1)^5$

$f'(x) = 5(2x+1)^4 \cdot \underbrace{2}_{\text{dérivée}} = 10(2x+1)^4$

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

cas particulier : $\left(\sqrt{u}\right)' = \dfrac{u'}{2\sqrt{u}}$

• $f(x) = \sqrt{x^2+4x}$

$u = x^2+4x$

$u' = 2x+4$

$f'(x) = \dfrac{2x+4}{2\sqrt{x^2+4x}}$

$\left(= \dfrac{2(x+2)}{2\sqrt{x^2+4x}} = \dfrac{x+2}{\sqrt{x^2+4x}} \right)$