Ch1 Analyse

Rappel : dérivée

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

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

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

| $(k)' = 0$

| $(kx)' = k$

| $(x^n)' = nx^{n-1}$

b) $\boxed{(u+v)' = u' + v'}$ u et v des fcts de x

exple : $f(x) = x^2 + 3x + 3 \qquad f'(x) = 2x + 3$

$f(x) = 2x^3 + \sin(x) \qquad f'(x) = 6x^2 + \cos(x)$

c) $\boxed{(u \cdot v)' = u'v + uv'}$

exple : $f(x) = 2x^3 \sin(x) \qquad f'(x) = 6x^2\sin(x) + 2x^3\cos(x)$

$u = 2x^3 \qquad v = \sin(x)$

$u' = 6x^2 \qquad v' = \cos(x)$

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

exple : $f(x) = \frac{2x^3}{\sin(x)} \qquad f'(x) = \frac{6x^2\sin(x) - 2x^3\cos(x)}{\underbrace{(\sin(x))^2}_{=\sin^2(x)}}$

e) $\boxed{(u^n)' = n \cdot u^{n-1} \cdot u'}$ ← dérivée interne

exple : $f(x) = \underbrace{(2x^2+3x+4)}_{u}^5$ $\qquad f'(x) = 5(2x^2+3x+4)^4 \cdot \underbrace{(4x+3)}_{=u'}$

cas particulier : $\boxed{(\sqrt{u})' = (u^{1/2})' = \frac{1}{2}u^{-1/2} \cdot u' = \frac{1}{2} \cdot \frac{1}{\underbrace{u^{1/2}}_{\sqrt{u}}} \cdot u'}$

$$\boxed{= \frac{u'}{2\sqrt{u}}}$$