Dérivées des fonctions usuelles

f(x)	f'(x)	Exemple
a	0	$f(x) = 3, \ f'(x) = 0$
$ax + b$	a	$f(x) = 2x + 1, \ f'(x) = 2$
x^n	nx^{n-1}	$f(x) = x^3 + 3x^2, \ f'(x) = 3x^2 + 6x$
$\dfrac{1}{x^n}$	$\dfrac{-n}{x^{n+1}}$	$f(x) = \dfrac{1}{x}, \ f'(x) = \dfrac{-1}{x^2}$
$\sqrt{x}$	$\dfrac{1}{2\sqrt{x}}$	$f(x) = 3\sqrt{x}, \ f'(x) = \dfrac{3}{2\sqrt{x}}$
$\cos(x)$	$-\sin(x)$	$f(x) = 2\cos(x), \ f'(x) = -2\sin(x)$
$\sin(x)$	$\cos(x)$	$f(x) = \dfrac{\sin(x)}{2}, \ f'(x) = \dfrac{\cos(x)}{2}$
$\exp(x)$	$\exp(x)$	$f(x) = 4\exp(x), \ f'(x) = 4\exp(x)$
$\ln(x)$	$\dfrac{1}{x}$	$f(x) = 6\ln(x), \ f'(x) = \dfrac{6}{x}$

f(x)	f'(x)	Exemple
$u(ax + b)$	$a \times u'(ax + b)$	$f(x) = e^{2x+1}, \ f'(x) = 2e^{2x+1}$
$(u(x))^n$	$nu'(x)(u(x))^{n-1}$	$f(x) = (3x + 4)^6,$ $f'(x) = 3 \times 6(3x + 4)^5 = 18(3x + 4)^5$
$\dfrac{1}{(u(x))^n}$	$-\dfrac{nu'(x)}{(u(x))^{n+1}}$	$f(x) = \dfrac{1}{(2x - 1)^3},$ $f'(x) = -\dfrac{3 \times 2}{(2x - 1)^4} = -\dfrac{6}{(2x - 1)^4}$
$\sqrt{u(x)}$	$\dfrac{u'(x)}{2\sqrt{u(x)}}$	$f(x) = \sqrt{x^3 + 2x}, \ f'(x) = \dfrac{3x + 2}{2\sqrt{x^3 + 2x}}$
$\cos(u(x))$	$-u'(x)\sin(u(x))$	$f(x) = 4\cos(x^2),$ $f'(x) = -4 \times 2x\sin(x^2) = -8x\sin(x^2)$
$\sin(u(x))$	$u'(x)\cos(u(x))$	$f(x) = \sin(4x + 3),$ $f'(x) = 4\cos(4x + 3)$
$\exp(u(x))$	$u'(x)\exp(u(x))$	$f(x) = \exp(x^2 + 3x),$ $f'(x) = (2x + 3)\exp(x^2 + 3x)$
$\ln(u(x))$	$\dfrac{u'(x)}{u(x)}$	$f(x) = \ln(4x + 2), \ f'(x) = \dfrac{4}{4x + 2} = \dfrac{2}{2x + 1}$

Opérations sur les dérivées

f(x)	f′(x)	Exemple
$k \times u(x)$	$k \times u'(x)$	$f(x) = 3x^4,\ f'(x) = 3 \times 4x^3 = 12x^3$
$u(x) + v(x)$	$u'(x) + v'(x)$	$f(x) = \exp(x) + x,\ f'(x) = \exp(x) + 1$
$u(x) \times v(x)$	$u'(x)v(x) + u(x)v'(x)$	$f(x) = x\ln(x),$ $f'(x) = 1 \times \ln(x) + x \times \dfrac{1}{x} = \ln(x) + 1$
$\dfrac{1}{u(x)}$	$\dfrac{-u'(x)}{(u(x))^2}$	$f(x) = \dfrac{1}{3x^2 + 4x},\ f'(x) = \dfrac{-(6x + 4)}{(3x^2 + 4x)^2}$
$\dfrac{u(x)}{v(x)}$	$\dfrac{u'(x)v(x) - u(x)v'(x)}{(v(x))^2}$	$f(x) = \dfrac{2x + 1}{3x},$ $f'(x) = \dfrac{2 \times 3x - (2x + 1) \times 3}{(3x)^2} = \dfrac{1}{3x^2}$