Calculs de dérivées

Dériver *proprement* en fonction de x les expressions suivantes sans faire de brouillon préalable !

$$(2x-3)^4 \longrightarrow \frac{\left(x^2-3x\right)-(x+1)(2x-3)}{\left(x^2-3x\right)^2} = \frac{-x^2-2x+3}{x^2(x-3)^2}$$

$$\left(x^4+2x^2\right)^7 \longrightarrow 7\left(x^4+2x^2\right)^6 \cdot \left(4x^3+4x\right) = 28x^{13}\left(x^2+1\right)\left(x^2+2\right)^6$$

$$\left(x^3-4x\right)\cdot \ln\left(x^2+x\right) \longrightarrow \left(3x^2-4\right)\ln\left(x^2+x\right) + \frac{\left(x^3-4x\right)(2x+1)}{x^2+x}$$

$$\frac{x+1}{x^2-3x} \longrightarrow \frac{x-1}{2x^2+4x}\cdot\frac{(4x+4)(x-1)-\left(2x^2+4x\right)}{(x-1)^2} = \frac{2x^2-4x-4}{2x(x+2)(x-1)}$$

$$\left(\frac{2x-1}{3x+5}\right)^5 \longrightarrow 5\left(\frac{2x-1}{3x+5}\right)^4\cdot\frac{2(3x+5)-(2x-1)\cdot 3}{(3x+5)^2} = 65\cdot\frac{(2x-1)^4}{(3x+5)^6}$$

$$\sqrt{\frac{1+\ln\left(x^2\right)}{4}} \longrightarrow \frac{1}{2\sqrt{\frac{1+\ln\left(x^2\right)}{4}}}\cdot\frac{1}{4}\cdot\frac{2}{x} = \frac{1}{2x\sqrt{1+\ln\left(x^2\right)}}$$

$$e^{\left(x^2+x\right)\left(3x^3+5\right)} \longrightarrow e^{\left(x^2+x\right)\left(3x^3+5\right)}\cdot\left((2x+1)\left(3x^3+5\right)+\left(x^2+x\right)\cdot 9x^2\right)$$

$$\ln\left(\frac{2x^2+4x}{x-1}\right) \longrightarrow \frac{x-1}{2x^2+4x}\cdot\frac{(4x+4)(x-1)-\left(2x^2+4x\right)}{(x-1)^2} = \frac{2x^2-4x-4}{2x(x+2)(x-1)}$$

$$\frac{\sqrt{x}+1}{x^2+3x} \longrightarrow \frac{\frac{1}{1\sqrt{x}}\cdot\left(x^2+3x\right)-\left(\sqrt{x}+1\right)\cdot(2x+3)}{\left(x^2+3x\right)^2}$$

$$\ln\left(\frac{\sqrt{x^2+4x}}{x-1}\right) \longrightarrow \frac{x-1}{\sqrt{x^2+4x}}\cdot\frac{\frac{1}{2\sqrt{x^2+4x}}\cdot(2x+4)(x-1)-\sqrt{x^2-4x}}{(x-1)^2}$$

$$\frac{2x}{-\sqrt{x^2+1}} \longrightarrow \frac{-2\sqrt{x^2+1}+2x\cdot\frac{1}{\sqrt{x^2+1}}\cdot 2x}{x^2+1}$$