Rappels :

$a^n \times a^p = a^{n+p}$

$(a^n)^p = a^{n \times p}$

$a^1 = a$

$a^0 = 1$

$a^{-n} = \frac{1}{a^n}$

$\frac{a}{b} + \frac{c}{d} = \frac{ad + bc}{bd}$

$\frac{a}{b} \times \frac{c}{d} = \frac{ac}{bd}$

pour $b \neq 0$ et $d \neq 0$

$\frac{a^n}{b^n} = \left(\frac{a}{b}\right)^n$

$(ab)^n = a^n \times b^n$

$\sqrt{a} \times \sqrt{b} = \sqrt{a \times b}$

$\frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}}$

Demo par recurrence

$\begin{cases} u_0 = \\ u_{n+1} = \end{cases}$ démontre $u_n =$

↳ $P_n =$

- Initialisation

Pour $n=0$ $u_0 =$ ou $U_0 \in]\dots[$

$u_1 =$, P_0 est vraie

- Heredite

Montrons que si $u_n =$ alors $u_{n+1} =$

Par hypo de rec $u_n =$

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$u_{n+1} =$ P_{n+1} vraie

- Conclusion pour tout $n \in \dots$ $u_n =$

Dérivées :

$f(x) = ax + b \longrightarrow f'(x) = a$

$f(x) = x^n \longrightarrow f'(x) = n\,x^{n-1}$

$f(x) = \frac{1}{x} = x^{-1} \longrightarrow f'(x) = -1\,x^{-2} = -\frac{1}{x^2}$

$f(x) = \frac{1}{x^2} = x^{-2} \longrightarrow f'(x) = -2\,x^{-3} = \frac{-2}{x^3}$

$f(x) = \sqrt{x} = x^{\frac{1}{2}} \longrightarrow f'(x) = \frac{1}{2} \times x^{-\frac{1}{2}} = \frac{1}{2\sqrt{x}}$

$f(x) = u + v \longrightarrow f'(x) = u' + v'$

$f = u \times v \longrightarrow f' = u' \times v + u \times v'$

$f = k \times u \longrightarrow f' = k \times u'$

$f = \frac{1}{v} \longrightarrow f' = \frac{-v'}{v^2}$

$f = \frac{u}{v} \longrightarrow f' = \frac{u' \times v - u \times v'}{v^2}$

à condition que $v(x) \neq 0$

$f(x) = \ln x \longrightarrow f'(x) = \frac{1}{x}$

$f(x) = e^x \longrightarrow f'(x) = e^x$

$f(x) = \sin x \longrightarrow f'(x) = \cos x$

$f(x) = v(u(x)) \longrightarrow f'(x) = u'(x) \times v'(u(x))$

$f(x) = u^n \longrightarrow f'(x) = n \times u' \times u^{n-1}$

$f(x) = x^3 \to f'(x) = 3x^2$

$f(x) = \cos x$
$\to f'(x) = -\sin x$