

CORRECTION

EXERCICE n°2 :

a. $f(x) = \frac{1}{2}(\ln x)^2 : D_f =]0; +\infty[$ et $f'(x) = \frac{1}{2} \times 2 \times \frac{1}{x} \times \ln x = \frac{\ln x}{x}$.

b. $f(x) = 2x(1 - \ln x) : D_f =]0; +\infty[$ et $f'(x) = 2 \times (1 - \ln x) + 2x \times \left(-\frac{1}{x}\right) = -2 \ln x$.

c. $f(x) = -\frac{x}{2} + 1 + 2 \ln x : D_f =]0; +\infty[$ et $f'(x) = -\frac{1}{2} + \frac{2}{x} = \frac{4-x}{2x}$.

d. $f(x) = \frac{2x^2}{5} - x \ln x : D_f =]0; +\infty[$ et $f'(x) = \frac{4x}{5} - \left(1 \times \ln x + x \times \frac{1}{x}\right) = \frac{4x}{5} - \ln x - 1$.

e. $f(x) = \frac{x - \ln x}{x} : D_f =]0; +\infty[$ et $f'(x) = \frac{\left(1 - \frac{1}{x}\right) \times x - (x - \ln x) \times 1}{x^2} = \frac{\ln x - 1}{x^2}$.

f. $f(x) = \frac{e}{\ln x} : D_f =]0; +\infty[$ et $f'(x) = e \times \left(-\frac{\frac{1}{x}}{(\ln x)^2}\right) = -\frac{e}{x(\ln x)^2}$.

g. $f(x) = \frac{x^2}{2}(3 - \ln x) : D_f =]0; 1[\cup]1; +\infty[$ et $f'(x) = x(3 - \ln x) + \frac{x^2}{2} \times \left(-\frac{1}{x}\right) = x\left(\frac{5}{2} - \ln x\right)$.

h. $f(x) = \frac{2x+1}{\ln x} : D_f =]0; 1[\cup]1; +\infty[$ et $f'(x) = \frac{2 \ln x - (2x+1) \times \frac{1}{x}}{(\ln x)^2} = \frac{2x \ln x - 2x - 1}{x(\ln x)^2}$.