

Si $f(x) = (1 + \ln(x))^2 \cdot \frac{1}{x}$, alors

$$\int f(x) dx = \frac{1}{3} (1 + \ln(x))^3 + C$$

En outre, $D_f = \mathbb{R}_+^*$.

On note encore que $f(x) = 0$

$$\Leftrightarrow \ln(x) = -1 \Leftrightarrow x = \frac{1}{e}$$

$$\int_{\frac{1}{e}}^k f(x) dx = \frac{8}{3} \Leftrightarrow \frac{1}{3} (1 + \ln(x))^3 \Big|_{\frac{1}{e}}^k = \frac{8}{3}$$

$$\Leftrightarrow \frac{1}{3} (1 + \ln k)^3 = \frac{8}{3}$$

$$\Leftrightarrow 1 + \ln k = 2 \Leftrightarrow \ln k = 1 \Leftrightarrow \underline{k = e}$$

