• $J = \int_0^1 x\mathrm{e}^{2x}\,\mathrm{d}x.$

Posons $\begin{cases} u(x) = x \\ v'(x) = \mathrm{e}^{2x} \end{cases}$ d'où $\begin{cases} u'(x) = 1 \\ v(x) = \dfrac{1}{2}\,\mathrm{e}^{2x} \end{cases}$

Ainsi, $J = \left[\dfrac{1}{2}\,x\mathrm{e}^{2x}\right]_0^1 - \displaystyle\int_0^1 \dfrac{1}{2}\,\mathrm{e}^{2x}\,\mathrm{d}x$

$$J = \frac{1}{2}\,\mathrm{e}^2 - \left[\frac{1}{4}\,\mathrm{e}^{2x}\right]_0^1 = \frac{1}{2}\,\mathrm{e}^2 - \left(\frac{1}{4}\,\mathrm{e}^2 - \frac{1}{4}\right)$$

$$J = \mathbf{\frac{1}{4}\,e^2 + \frac{1}{4}}.$$

48 $\displaystyle\int_0^1 3x\mathrm{e}^{-2x}\,\mathrm{d}x = \mathbf{\frac{3}{4}(1 - 3e^{-2})}.$

$$\int_1^{\mathrm{e}} \ln(2x)\,\mathrm{d}x = \mathbf{(\ln 2)(e - 1) + 1}.$$

50 $\displaystyle\int_1^2 (t+1)\ln(3t)\,\mathrm{d}t = \mathbf{\frac{\ln 62\,208}{2} - \frac{7}{4}}.$

$$\int_{-1}^0 (2t+1)\mathrm{e}^{3t}\,\mathrm{d}t = \mathbf{\frac{5e^{-3}}{9} + \frac{1}{9}}.$$