n°14 p259.

1) Calculer $I = \int_4^9 \frac{1}{2\sqrt{t}}\,dt$

Si $F(t) = \sqrt{t}$ alors $F'(t) = \frac{1}{2\sqrt{t}}$

donc $I = F(9) - F(4)$

$I = \sqrt{9} - \sqrt{4}$ $\quad I = 3 - 2$ $\quad \underline{I = 1}$

2) $J = \int_0^5 \frac{1}{u+2}\,du$

Si $F(u) = \ln(u+2)$ alors $F'(u) = \frac{1}{u+2}$

donc $J = F(5) - F(0)$

$J = \ln(5+2) - \ln(0+2)$ $\quad J = \ln(7) - \ln(2)$ $\quad \underline{J = \ln\frac{7}{2}}$

$\underline{J \approx 1{,}253}$

3) $K = \int_1^2 \frac{-2}{x^3}\,dx$ Par linéarité on a $K = -2\int_1^2 \frac{1}{x^3}\,dx$

On a $f(x) = \frac{1}{x^3} = x^{-3}$

Si $F(x) = x^{-2}$ alors $F'(x) = -2x^{-3}$

Si $F(x) = -\frac{1}{2} \times x^{-2}$ alors $F'(x) = -\frac{1}{2} \times -2x^{-3}$

donc $K = -2\left(F(2) - F(1)\right)$

$K = -2\left(-\frac{1}{2} \times 2^{-2} - \left(-\frac{1}{2} \times 1^{-2}\right)\right)$

$K = 2\left(\frac{1}{2} \times 2^{-2} - \left(\frac{1}{2} \times 1^{-2}\right)\right)$

$K = 2\left(\frac{1}{8} - \frac{1}{2}\right)$ $\quad K = 2\left(\frac{1}{8} - \frac{4}{8}\right)$ $\quad K = \frac{-6}{8} = \underline{-\frac{3}{4}}$

4) $L = \int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \sin(y)\,dy$

Si $F(y) = -\cos(y)$ alors $F'(y) = -(-\sin(y)) = \sin(y)$

Donc $L = F\left(\frac{\pi}{2}\right) - F\left(\frac{\pi}{4}\right)$

$L = -\cos\left(\frac{\pi}{2}\right) - \left(-\cos\left(\frac{\pi}{4}\right)\right)$

$L = -\cos\left(\frac{\pi}{2}\right) + \cos\left(\frac{\pi}{4}\right)$

$L = 0 + \frac{\sqrt{2}}{2}$ $\quad \underline{L = \frac{\sqrt{2}}{2} \approx 0{,}707}$