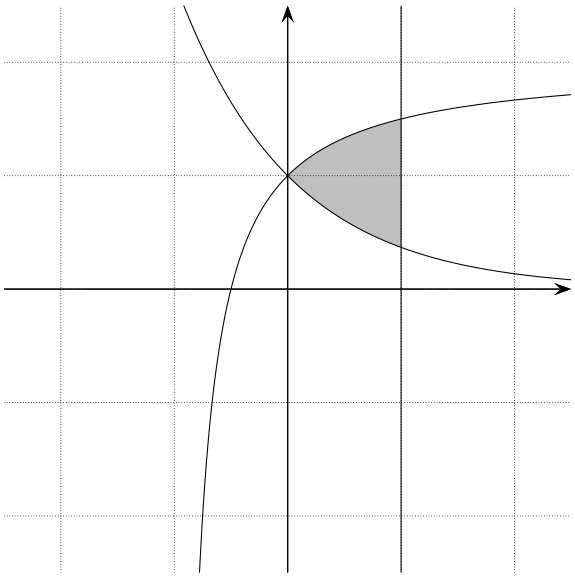
Chamblandes 2008 — Problème 3

a)



b)
$$\begin{array}{r|l} 2\,x\,+\,1 & x+1 \\ \hline -2\,x\,-\,2 & 2 \\ \hline -\,1 & \end{array}$$

$$\int_0^1 \frac{2\,x+1}{x+1}\,dx = \int_0^1 \left(2 - \frac{1}{x+1}\right)\,dx = \int_0^1 2\,dx - \int_0^1 \frac{1}{x+1}\,dx = \Big[2\,x - \ln\big(|x+1|\big)\Big]_0^1$$
$$= \Big(2\cdot 1 - \ln\big(|1+1|\big)\Big) - \Big(2\cdot 0 - \ln\big(|0+1|\big)\Big) = 2 - \ln(2) - 0 + \underbrace{\ln(1)}_{0} = 2 - \ln(2)$$

$$\int_0^1 e^{-x}\,dx = -\int_0^1 e^{-x}\cdot(-1)\,dx = -\int_0^1 e^{-x}\cdot(-x)'\,dx = \big[-e^{-x}\big]_0^1 =$$
$$-e^{-1} - (-e^{-0}) = -\tfrac{1}{e} + 1$$

L'aire grisée vaut donc : $\big(2 - \ln(2)\big) - \big(-\frac{1}{e} + 1\big) = 1 - \ln(2) + \frac{1}{e} \approx 0{,}675$