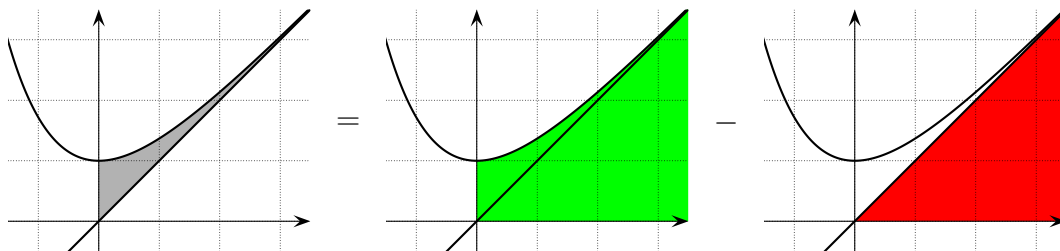


11.13



$$\begin{aligned}
 1) \quad \mathcal{A}_k &= \int_0^k (x + e^{-x}) dx - \int_0^k x dx = \int_0^k (x + e^{-x} - x) dx = \int_0^k e^{-x} dx \\
 &= -e^{-x} \Big|_0^k = -e^{-k} - (-e^{-0}) = 1 - e^{-k} = 1 - \frac{1}{e^k}
 \end{aligned}$$

$$2) \quad \lim_{k \rightarrow +\infty} \mathcal{A}_k = \lim_{k \rightarrow +\infty} \left(1 - \frac{1}{e^k}\right) = 1 - \lim_{k \rightarrow +\infty} \frac{1}{e^k} = 1 - \frac{1}{e^{+\infty}} = 1 - 0 = 1$$