Solve for x:

1. $\ln(x+2) - \ln(x) = 2$.

   Solution: We have

$$\begin{aligned} ln\left(\frac{x+2}{x}\right) &= 2 \\ \frac{x+2}{x} &= e^2 \\ x+2 &= xe^2 \\ 2 &= x(e^2-1) \\ x &= \frac{2}{e^2-1}. \end{aligned}$$

   It is necessary to check this; we get

$$\begin{aligned} \ln\left(\frac{2}{e^2-1}+2\right) - \ln\left(\frac{2}{e^2-1}\right) &= \ln\left(\frac{2e^2}{e^2-1}\right) - \ln\left(\frac{2}{e^2-1}\right) \\ &= \ln 2 + \ln e^2 - \ln(e^2-1) - [\ln 2 - \ln(e^2-1)] \\ &= \ln e^2 = 2. \end{aligned}$$

2. $e^{2x+5} = 50$.

   Solution: We have

$$\begin{aligned} 2x+5 &= \ln 50 \\ 2x &= ln(50) - 5 \\ x &= \frac{\ln 50 - 5}{2}. \end{aligned}$$