

$$\begin{aligned} \textcircled{2} \int_{-3}^{-2} \frac{x^3 - x + 1}{x+1} dx &= \int_{-3}^{-2} \left[\frac{x(x^2-1)}{x+1} + \frac{1}{x+1} \right] dx = \int_{-3}^{-2} \left[\sqrt{x-1} + \frac{1}{x+1} \right] dx = \left. \frac{x^3}{3} - \frac{x^2}{2} + \ln|x+1| \right|_{-3}^{-2} \\ &= \left(\frac{-8}{3} - 2 + \ln 1 \right) - \left(\frac{-27}{3} - \frac{9}{2} + \ln 2 \right) = 8\frac{5}{6} - \ln 2 \end{aligned}$$