$\int \ln x \, dx$

① $u = \ln x \qquad dv = 1 \, dx$

② $du = \frac{1}{x} dx \qquad v = x$

③ $\int \ln x \, dx = \ln x (x) - \int x \left(\frac{1}{x} dx\right)$

④ $\int \ln x \, dx = x \ln x - \int 1 \, dx$

$\int \ln x \, dx = x \ln x - x + C$