Integral of $\ln(x)$

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$$\int \ln(x)\,dx$$

Let $u = \ln(x)$, then $du = \dfrac{1}{x}\,dx$

Let $dv = dx$, then $v = x$

$$\begin{aligned}\int \ln(x)\,dx &= u\,v - \int v\,du \\ &= x\ln(x) - \int \frac{x}{x}\,dx \\ &= x\ln(x) - \int 1\,dx \\ &= x\ln(x) - x + C\end{aligned}$$

Therefore:

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