PROOF OF FORMULA 2.324.1

$$\int \frac{e^{ax}\,dx}{x^m} = \frac{1}{m-1}\left(-\frac{e^{ax}}{x^{m-1}} + a\int \frac{e^{ax}\,dx}{x^{m-1}}\right)$$

Start with

$$\int \frac{e^{ax}\,dx}{x^m} = \int x^{-m}e^{ax}\,dx$$

and integrate by parts with $u = e^{ax}$ and $dv = x^{-m}\,dx$ to obtain the result.