## PROOF OF FORMULA 2.322.1

$$\int xe^{ax}dx = e^{ax}\left(\frac{x}{a} - \frac{1}{a^2}\right)$$

Formula 2.321.2 states that

$$\int x^n e^{ax}\,dx = e^{ax}\left(\sum_{k=0}^{n} \frac{(-1)^k k!\binom{n}{k}}{a^{k+1}} x^{n-k}\right).$$

The case $n = 1$ produces the requested evaluation.