

**PROOF OF FORMULA 2.321.1**

$$\int x^n e^{ax} dx = \frac{x^n e^{ax}}{a} - \frac{n}{a} \int x^{n-1} e^{ax} dx$$

Integrate by parts with  $u = x^n$  and  $dv = e^{ax} dx$ . Then  $du = nx^{n-1} dx$  and  $v = e^{ax}/a$ . The result follows.