PROOF OF FORMULA 3.351.9

$$\int_0^a x^3 e^{-\mu x}\,dx = \frac{6}{\mu^4} - \frac{e^{-a\mu}}{\mu^4}(6 + 6a\mu + 3a^2\mu^2 + 3a^3\mu^3)$$

Entry **3.351.1** states that

$$\int_0^a x^n e^{-\mu x}\,dx = \frac{n!}{\mu^{n+1}} - e^{-a\mu}\sum_{k=0}^{n}\frac{n!}{k!}\frac{a^k}{\mu^{n-k+1}}.$$

The result follows by taking $n = 3$.