

1. $\int x^n e^{ax} dx = \frac{x^n e^{ax}}{a} - \frac{n}{a} \int x^{n-1} e^{ax} dx$
2. $\int_0^{\infty} x^n e^{-ax} dx = \frac{n!}{a^{n+1}}, \quad n > -1, a > 0$
3. $\int_0^{\infty} e^{-ax^2} dx = \frac{1}{2} \sqrt{\frac{\pi}{a}}$
4. $\int_0^{\infty} x^2 e^{-ax^2} dx = \frac{1}{4} \sqrt{\frac{\pi}{a^3}}$
5. $\int_0^{\infty} x^{2n} e^{-ax^2} dx = \frac{1 \cdot 3 \cdots (2n-1)}{2^{n+1}} \sqrt{\frac{\pi}{a^{2n+1}}}$
6. $\int_0^{\infty} x e^{-ax^2} dx = \frac{1}{2a}$
7. $\int_0^{\infty} x^3 e^{-ax^2} dx = \frac{1}{2a^2}$
8. $\int_0^{\infty} x^{2n+1} e^{-ax^2} dx = \frac{n!}{2a^{n+1}}$
9. $\int_1^{\infty} e^{-ax} dx = \frac{e^{-a}}{a}$
10. $\int_1^{\infty} x e^{-ax} dx = \frac{e^{-a}}{a^2} (1+a)$
11. $\int_1^{\infty} x^2 e^{-ax} dx = \frac{2e^{-a}}{a^3} \left(1+a+\frac{a^2}{2}\right)$
12. $\int_1^{\infty} x^n e^{-ax} dx = \frac{n! e^{-a}}{a^{n+1}} \sum_{k=0}^n \frac{a^k}{k!} \equiv A_n(a)$
13. $\int_{-1}^{+1} e^{-ax} dx = \frac{1}{a} (e^a - e^{-a})$
14. $\int_{-1}^{+1} x e^{-ax} dx = \frac{1}{a^2} \{e^a - e^{-a} - a(e^a + e^{-a})\}$
15. $\int_{-1}^{+1} x^n e^{-ax} dx = (-1)^{n+1} A_n(-a) - A_n(a)$