

! For an efficient use of these tables, first read [HowTo.pdf](#).

T3.43C. Integrands involving product of trigonometric functions, exponentials and powers of x and $1/x$ on the interval $(-\infty, \infty)$.

$$1. \int_{-\infty}^{\infty} x^n e^{-(ax^2+bx+c)} \sin(px+q) dx = \left(\frac{-1}{2a}\right)^n \sqrt{\frac{\pi}{a}} \exp\left(\frac{b^2-p^2}{4a} - c\right) \sum_{k=0}^{[n/2]} \frac{n!}{(n-2k)!k!} a^k \\ \times \sum_{j=0}^{n-2k} \binom{n-2k}{j} b^{n-2k-j} p^j \sin\left(\frac{pb}{2a} - q + \frac{\pi}{2}j\right), \quad a > 0.$$

$$2. \int_{-\infty}^{\infty} x^n e^{-(ax^2+bx+c)} \cos(px+q) dx = \left(\frac{-1}{2a}\right)^n \sqrt{\frac{\pi}{a}} \exp\left(\frac{b^2-p^2}{4a} - c\right) \sum_{k=0}^{[n/2]} \frac{n!}{(n-2k)!k!} a^k \\ \times \sum_{j=0}^{n-2k} \binom{n-2k}{j} p^j \cos\left(\frac{pb}{2a} - q + \frac{\pi}{2}j\right), \quad a > 0.$$
