

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

T2.41C. Integrands involving sine and cosine of single and multiple arguments on the interval $(0, 2\pi)$.

$$1. \int_0^{2\pi} (1 - \cos x)^n \sin nx \, dx = 0.$$

$$2. \int_0^{2\pi} (1 - \cos x)^n \cos nx \, dx = (-1)^n \frac{\pi}{2^{n-1}}.$$

$$3. \int_0^{2\pi} \frac{\sin nx \, dx}{(1 - 2a \cos 2x + a^2)^n} = 0.$$

$$4. \int_0^{2\pi} \frac{dx}{(1 - 2a \cos x + a^2)^n} = \begin{cases} \frac{2\pi}{(1 - a^2)^n} \sum_{k=0}^{n-1} \frac{(n+k-1)!}{(k!)^2(n-k-1)!} \left(\frac{a^2}{1 - a^2} \right)^k, & a^2 < 1, \\ \frac{2\pi}{(a^2 - 1)^n} \sum_{k=0}^{n-1} \frac{(n+k-1)!}{(k!)^2(n-k-1)!} \frac{1}{(a^2 - 1)^k}, & a^2 > 1. \end{cases}$$
