! For an efficient use of these tables, first read `HowTo.pdf`.

T2.46C. Integrands involving square roots of expressions containing trigonometric functions on the interval $(0, \pi)$.

$$1. \int_0^\pi \frac{\sin^{2n} x\, dx}{\sqrt{1 - k^2 \sin^2 x}} = \begin{cases} \dfrac{\pi}{2^n} \displaystyle\sum_{j=0}^{\infty} \frac{(2j-1)!!(2n+2j-1)!!}{2^{2j} j!(n+j)!} k^{2j}, & k^2 < 1, \\ \dfrac{(2n-1)!!\pi}{2^n \sqrt{1-k^2}} \displaystyle\sum_{j=0}^{\infty} \frac{[(2j-1)!!]^2}{2^{2j} j!(n+j)!} \left(\frac{k^2}{k^2-1}\right)^j, & k^2 < \frac{1}{2}. \end{cases}$$

$$2. \int_0^\pi \frac{dx}{\sqrt{1 \pm 2p \cos x + p^2}} = 2\mathbf{K}(p), \quad p^2 < 1.$$

$$3. \int_0^\pi \frac{\sin x\, dx}{\sqrt{1 - 2p \cos x + p^2}} = \begin{cases} 2, & p^2 \le 1, \\ \dfrac{2}{p}, & p^2 \ge 1. \end{cases}$$

$$4. \int_0^\pi \frac{\cos x\, dx}{\sqrt{1 - 2p \cos x + p^2}} = \frac{1}{p} \left[\frac{1+p^2}{1+p} \mathbf{K}\left(\frac{2\sqrt{p}}{1+p}\right) - (1+p)\, \mathbf{E}\left(\frac{2\sqrt{p}}{1+p}\right) \right], \quad p^2 < 1.$$