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

T2.52A. Integrands involving trigonometric functions and square roots of algebraic functions on the interval $(0, 1)$.

1. $\displaystyle\int_0^1 \sin(ax)\sqrt{1-x^2}\,dx = \sum_{k=0}^{\infty} \frac{(-1)^k a^{2k+1}}{(2k-1)!!(2k+3)!!} = \frac{\pi}{2a}\,\mathbf{H}_1(a), \quad a > 0.$

2. $\displaystyle\int_0^1 \cos(ax)\sqrt{1-x^2}\,dx = \frac{\pi}{2a} J_1(a).$

3. $\displaystyle\int_0^1 \frac{\sin(ax)\,dx}{\sqrt{1-x^2}} = \sum_{k=0}^{\infty} \frac{(-1)^k a^{2k+1}}{[(2k+1)!!]^2} = \frac{\pi}{2}\,\mathbf{H}_0(a), \quad a > 0.$

4. $\displaystyle\int_0^1 \frac{\cos(ax)\,dx}{\sqrt{1-x^2}} = \frac{\pi}{2} J_0(a).$

5. $\displaystyle\int_0^1 \frac{x\,\sin(ax)}{\sqrt{1-x^2}}\,dx = \frac{\pi}{2} J_1(a), \quad a > 0.$

6. $\displaystyle\int_0^1 \frac{1}{\sqrt{1-2x\,\cos t + x^2}}\,dx = \ln\left[1 + \csc\frac{t}{2}\right].$
