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

T3.37A. Integrands involving trigonometric functions and square roots of algebraic functions on the interval $(0, \infty)$.

1. $$\int_0^\infty \frac{\sin(ax)\,dx}{\sqrt{x+\beta}} = \sqrt{\frac{\pi}{2a}}\,\left[\cos(a\beta) - \sin(a\beta) + 2C(\sqrt{a\beta})\,\sin(a\beta) - 2S(\sqrt{a\beta})\,\cos(a\beta)\right], \quad a > 0,\ |\arg\beta| < \pi.$$

2. $$\int_0^\infty \frac{\cos(ax)\,dx}{\sqrt{x+\beta}} = \sqrt{\frac{\pi}{2a}}\,\left[\cos(a\beta) + \sin(a\beta) - 2C(\sqrt{a\beta})\,\cos(a\beta) - 2S(\sqrt{a\beta})\,\sin(a\beta)\right], \quad a > 0,\ |\arg\beta| < \pi.$$

3. $$\int_0^\infty \frac{\sin(ax)\,dx}{\sqrt{\beta^2+x^2}} = \frac{\pi}{2}\,\left[I_0(a\beta) - \mathbf{L}_0(a\beta)\right], \quad a > 0,\ \Re\{\beta\} > 0.$$

4. $$\int_0^\infty \frac{\cos(ax)\,dx}{\sqrt{\beta^2+x^2}} = K_0(a\beta), \quad a > 0,\ \Re\{\beta\} > 0.$$

5. $$\int_0^\infty \frac{x\,\sin(ax)}{\sqrt{(\beta^2+x^2)^3}}\,dx = a\,K_0(a\beta), \quad a > 0,\ \Re\{\beta\} > 0.$$

6. $$\int_0^\infty \frac{\sqrt{\sqrt{x^2+\beta^2}-\beta}\,\sin(ax)\,dx}{\sqrt{x^2+\beta^2}} = \sqrt{\frac{\pi}{2a}}\,e^{-a\beta}, \quad a > 0.$$

7. $$\int_0^\infty \frac{\sqrt{\sqrt{x^2+\beta^2}+\beta}\,\cos(ax)\,dx}{\sqrt{x^2+\beta^2}} = \sqrt{\frac{\pi}{2a}}\,e^{-a\beta}, \quad a > 0,\ \Re\{\beta\} > 0.$$

8. $$\int_0^\infty \frac{\sin(ax)}{x^{n/2-1}} \prod_{k=2}^{n} \sin(a_k x)\,dx = 0, \quad a_k > 0,\ a > \sum_{k=2}^{n} a_k.$$

9. $\displaystyle\int_0^\infty x^{n/2-1}\,\cos(ax)\prod_{k=1}^{n}\cos(a_k x)\,dx = 0, \quad a_k > 0,\ a > \sum_{k=1}^{n} a_k.$

10. $\displaystyle\int_0^\infty \frac{\sin(ax)}{\sqrt{x}}\,dx = \sqrt{\frac{\pi}{2a}}.$

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