C4282

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

T3.23A. Integrands involving exponentials of hyperbolic functions on the interval $(0, \infty)$.

1. $$\int_0^\infty (e^{\nu x} + e^{-\nu x} \cos \nu\pi) \exp(-\beta \sinh x)\, dx = -\pi[\mathbf{E}_\nu(\beta) + Y_\nu(\beta)], \quad \Re\{\beta\} > 0.$$

2. $$\int_0^\infty \exp(-\nu x - \beta \sinh x)\, dx = \pi \csc \nu\pi [\mathbf{J}_\nu(\beta) - J_\nu(\beta)],$$
$$|\arg \beta| < \frac{\pi}{2} \text{ and } |\arg \beta| = \frac{\pi}{2} \text{ for } \Re\{\nu\} > 0;\ \nu \text{ not an integer.}$$

3. $$\int_0^\infty \exp(nx - \beta \sinh x)\, dx = \frac{1}{2}[S_n(\beta) - \pi \mathbf{E}_n(\beta) - \pi Y_n(\beta)], \quad \Re\{\beta\} > 0;\ n = 0, 1, 2, \ldots.$$

4. $$\int_0^\infty \exp(-nx - \beta \sinh x)\, dx = \frac{1}{2}(-1)^{n+1}[S_n(\beta) + \pi \mathbf{E}_n(\beta) + \pi Y_n(\beta)],$$
$$\Re\{\beta\} > 0;\ n = 0, 1, 2, \ldots.$$

5. $$\int_0^\infty e^{-s\,x}\ (\sinh x)^k\ dx = \frac{\Gamma(k+1)}{2^{k+1}} \frac{\Gamma\left(\frac{s-k}{2}\right)}{\Gamma\left(\frac{s+k}{2} - 1\right)}, \quad s > k.$$
