

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

T2.10B. Integrands of the form $\sqrt{\pm \frac{(a-x)(b-x)}{(c-x)}}$, $\sqrt{\pm \frac{(b-x)(c-x)}{(a-x)}}$ and $\sqrt{\pm \frac{(a-x)(c-x)}{(b-x)}}$ on the intervals (y, b) and (b, y) .

Notation used: $\delta = \arcsin \sqrt{\frac{(a-c)(b-y)}{(b-c)(a-y)}}$, $\kappa = \arcsin \sqrt{\frac{(a-c)(y-b)}{(a-b)(y-c)}}$,

$$p = \sqrt{\frac{a-b}{a-c}}, \quad q = \sqrt{\frac{b-c}{a-c}}.$$

$$\begin{aligned} 1. \int_y^b \sqrt{\frac{(x-c)(b-x)}{a-x}} dx &= \frac{2}{3} \sqrt{a-c} [2(b-a)F(\delta, q) + (2a-b-c)E(\delta, q)] \\ &\quad + \frac{2}{3}(b+c-a-y) \sqrt{\frac{(b-y)(y-c)}{a-y}}, \quad a > b > y \geq c. \end{aligned}$$

$$\begin{aligned} 2. \int_b^y \sqrt{\frac{(x-b)(x-c)}{a-x}} dx &= \frac{2}{3} \sqrt{a-c} [(2a-b-c)E(\kappa, p) - (b-c)F(\kappa, p)] \\ &\quad + \frac{2}{3}(b+2c-2a-y) \sqrt{\frac{(a-y)(y-b)}{y-c}}, \quad a \geq y > b > c]. \end{aligned}$$

$$\begin{aligned} 3. \int_y^b \sqrt{\frac{(a-x)(x-c)}{b-x}} dx &= \frac{2}{3} \sqrt{a-c} [(a-b)F(\delta, q) + (2b-a-c)E(\delta, q)] \\ &\quad + \frac{2}{3}(2a+c-2b-y) \sqrt{\frac{(b-y)(y-c)}{a-y}}, \quad a > b > y \geq c. \end{aligned}$$

$$4. \int_b^y \sqrt{\frac{(a-x)(x-c)}{x-b}} dx = \frac{2}{3} \sqrt{a-c} [(b-c)F(\kappa, p) + (a+c-2b)E(\kappa, p)] \\ + \frac{2}{3} (2b-a-2c+y) \sqrt{\frac{(a-y)(y-b)}{y-c}}, \quad a \geq y > b > c.$$

$$5. \int_y^b \sqrt{\frac{(a-x)(b-x)}{x-c}} dx = \frac{2}{3} \sqrt{a-c} [(a+b-2c)E(\delta, q) - (a-b)F(\delta, q)] \\ + \frac{2}{3} (2c-2a-b+y) \sqrt{\frac{(b-y)(y-c)}{a-y}}, \quad a > b > y \geq c.$$

$$6. \int_b^y \sqrt{\frac{(a-x)(x-b)}{x-c}} dx = \frac{2}{3} \sqrt{a-c} [(a+b-2c)E(\kappa, p) - 2(b-c)F(\kappa, p)] \\ + \frac{2}{3} (y+c-a-b) \sqrt{\frac{(a-y)(y-b)}{y-c}}, \quad a \geq y > b > c.$$
