

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

**T2.06A.** Integrands of the form  $\frac{1}{\sqrt{(a-x)(b-x)^n(c-x)^n}}$ ,  $\frac{1}{\sqrt{(a-x)^n(b-x)(c-x)^n}}$ ,  $\frac{1}{\sqrt{(a-x)^n(b-x)^n(c-x)}}$  for  $n = 3, 5$ , on the intervals  $(y, a)$ ,  $(a, y)$ ,  $(y, b)$ ,  $(b, y)$ ,  $(y, c)$ , and  $(c, y)$ .

Notation used:  $\beta = \arcsin \sqrt{\frac{c-y}{b-y}}$ ,  $\gamma = \arcsin \sqrt{\frac{y-c}{b-c}}$ ,  
 $\delta = \arcsin \sqrt{\frac{(a-c)(b-y)}{(b-c)(a-y)}}$ ,  $\kappa = \arcsin \sqrt{\frac{(a-c)(y-b)}{(a-b)(y-c)}}$ ,  
 $\lambda = \arcsin \sqrt{\frac{a-y}{a-b}}$ ,  $\mu = \arcsin \sqrt{\frac{y-a}{y-b}}$ ,  $p = \sqrt{\frac{a-b}{a-c}}$ ,  $q = \sqrt{\frac{b-c}{a-c}}$ .

$$1. \int_y^a \frac{dx}{\sqrt{(a-x)(x-b)^3(x-c)^3}} = \frac{2}{(a-b)(b-c)^2\sqrt{a-c}} [(b-c)F(\lambda, p) - 2(2a-b-c)E(\lambda, p)] \\ + \frac{2(a-b-c+y)}{(a-b)(b-c)(a-c)} \sqrt{\frac{a-y}{(y-b)(y-c)}}, \quad a > y > b > c.$$

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

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

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

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

$$6. \int_c^y \frac{dx}{\sqrt{(a-x)^3(b-x)^3(x-c)}} = \frac{2}{(a-b)^2(b-c)\sqrt{a-c}} [(a-b)F(\gamma, q) - (a+b-2c)E(\gamma, q)] \\ + \frac{2[a^2+b^2-ac-bc-y(a+b-2c)]}{(a-b)^2(b-c)(a-c)} \sqrt{\frac{y-c}{(a-y)(b-y)}}, \quad a > b > y > c.$$


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