

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

T3.05A. 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, ∞) and $(-\infty, y)$.

Notation used: $\alpha = \arcsin \sqrt{\frac{a-c}{a-y}}$, $\nu = \arcsin \sqrt{\frac{a-c}{y-c}}$,
 $p = \sqrt{\frac{a-b}{a-c}}$, $q = \sqrt{\frac{b-c}{a-c}}$.

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

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

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

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

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

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

$$7. \int_{-\infty}^y \frac{dx}{\sqrt{(a-x)^3(b-x)^3(c-x)^3}} = \frac{2}{(a-b)^2(b-c)^2\sqrt{(a-c)^3}} \\ \times [(b-c)(a+b-2c)F(\alpha, p) - 2(c^2+a^2+b^2-ab-ac-bc)E(\alpha, p)] \\ + \frac{2[c(a-c)+b(a-b)-y(2a-c-b)]}{(a-b)(a-c)(b-c)^2\sqrt{(a-y)(b-y)(c-y)}}, \quad a > b > c > y.$$

$$8. \int_y^{\infty} \frac{dx}{\sqrt{(x-a)^3(x-b)^3(x-c)^3}} = \frac{2}{(a-b)^2(b-c)^2\sqrt{(a-c)^3}} \\ \times [(a-b)(2a-b-c)F(\nu, q) - 2(a^2+b^2+c^2-ab-ac-bc)E(\nu, q)] \\ + \frac{2[y(a+b-2c)-a(a-c)-b(b-c)]}{(a-b)^2(a-c)(b-c)\sqrt{(y-a)(y-b)(y-c)}}, \quad y > a > b > c.$$
