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

T2.17B. Integrands of the form $\dfrac{x^n}{\sqrt{\left(a^2 \pm x^2\right)^3\left(b^2 \pm x^2\right)}}$ and $\dfrac{x^n}{\sqrt{\left(a^2 \pm x^2\right)\left(b^2 \pm x^2\right)^3}}$ for $n = 0, 2$, on the intervals (y, b) and (b, y).

Notation used: $\delta = \arccos \dfrac{y}{b}$, $\varepsilon = \arccos \dfrac{b}{y}$,

$$\zeta = \arcsin \frac{a}{b}\sqrt{\frac{b^2 - y^2}{a^2 - y^2}}, \quad \kappa = \arcsin \frac{a}{y}\sqrt{\frac{y^2 - b^2}{a^2 - b^2}},$$

$$q = \frac{\sqrt{a^2 - b^2}}{a}, \quad r = \frac{b}{\sqrt{a^2 + b^2}}, \quad s = \frac{a}{\sqrt{a^2 + b^2}}, \quad t = \frac{b}{a}.$$

1. $$\int_y^b \frac{dx}{\sqrt{(a^2 + x^2)^3 (b^2 - x^2)}} = \frac{1}{a^2\sqrt{a^2 + b^2}} E(\delta,\, r) - \frac{y}{a^2(a^2 + b^2)}\sqrt{\frac{b^2 - y^2}{a^2 + y^2}}, \quad b > y \geq 0.$$

2. $$\int_b^y \frac{dx}{\sqrt{(a^2 + x^2)^3 (x^2 - b^2)}} = \frac{1}{a^2\sqrt{a^2 + b^2}} \{F(\varepsilon,\, s) - E(\varepsilon,\, s)\} + \frac{1}{(a^2 + b^2)y}\sqrt{\frac{y^2 - b^2}{y^2 + a^2}}, \quad y > b > 0.$$

3. $$\int_y^b \frac{dx}{\sqrt{(a^2 - x^2)^3 (b^2 - x^2)}} = \frac{1}{a(a^2 - b^2)} E(\zeta,\, t), \quad a > b > y \geq 0.$$

4. $$\int_b^y \frac{dx}{\sqrt{(a^2 - x^2)^3 (x^2 - b^2)}} = \frac{1}{a(a^2 - b^2)} \left\{ F(\kappa,\, q) - E(\kappa,\, q) + \frac{a}{y}\sqrt{\frac{y^2 - b^2}{a^2 - y^2}} \right\}, \quad a > y > b > 0.$$

5. $$\int_y^b \frac{x^2\, dx}{\sqrt{(a^2 + x^2)^3 (b^2 - x^2)}} = \frac{1}{\sqrt{a^2 + b^2}} \{F(\delta,\, r) - E(\delta,\, r)\} + \frac{y}{a^2 + b^2}\sqrt{\frac{b^2 - y^2}{a^2 + y^2}}, \quad b > y \geq 0.$$

6. $$\int_b^y \frac{x^2\,dx}{\sqrt{(a^2+x^2)^3(x^2-b^2)}} = \frac{1}{\sqrt{a^2+b^2}}E(\varepsilon,\,s) - \frac{a^2}{y(a^2+b^2)}\sqrt{\frac{y^2-b^2}{y^2+a^2}}, \quad y > b > 0.$$

7. $$\int_y^b \frac{x^2\,dx}{\sqrt{(a^2-x^2)^3(b^2-x^2)}} = \frac{a}{a^2-b^2}E(\zeta,\,t) - \frac{1}{a}F(\zeta,\,t), \quad a > b > y \geq 0.$$

8. $$\int_b^y \frac{x^2\,dx}{\sqrt{(a^2-x^2)^3(x^2-b^2)}} = \frac{1}{a(a^2-b^2)}\left\{b^2F(\kappa,\,q) - a^2E(\kappa,\,q) + \frac{a^3}{y}\sqrt{\frac{y^2-b^2}{a^2-y^2}}\right\}, \quad a > y > b > 0.$$