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

T2.20A. Integrands of the form $\dfrac{1}{\sqrt{(a^2 \pm x^2)^3\,(b^2 \pm x^2)^3}}$ on the interval $(0, y)$.

Notation used: $\alpha = \arctan\dfrac{y}{b}$, $\gamma = \arcsin\dfrac{y}{b}\sqrt{\dfrac{a^2+b^2}{a^2+y^2}}$, $\eta = \arcsin\dfrac{y}{b}$,

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

1. $$\int_0^y \frac{dx}{\sqrt{(x^2+a^2)^3(x^2+b^2)^3}} = \frac{1}{ab^2(a^2-b^2)^2}\left\{(a^2+b^2)E(\alpha,\, q) - 2b^2F(\alpha,\, q)\right\} - \frac{y}{a^2(a^2-b^2)\sqrt{(a^2+y^2)(b^2+y^2)}}, \quad a > b,\ y > 0.$$

2. $$\int_0^y \frac{dx}{\sqrt{(x^2+a^2)^3(b^3-x^2)^3}} = \frac{1}{a^2b^2\sqrt{(a^2+b^2)^3}}\left\{a^2F(\gamma,\, r) - (a^2-b^2)E(\gamma,\, r)\right\} + \frac{y}{b^2(a^2+b^2)\sqrt{(a^2+y^2)(b^2-y^2)}}, \quad b > y > 0.$$

3. $$\int_0^y \frac{dx}{\sqrt{(a^2-x^2)^3(b^2-x^2)^3}} = \frac{1}{ab^2(a^2-b^2)}F(\eta,\, t) - \frac{a^2+b^2}{ab^2(a^2-b^2)^2}E(\eta,\, t) + \frac{[a^4+b^4-(a^2+b^2)y^2]y}{a^2b^2(a^2-b^2)^2\sqrt{(a^2-y^2)(b^2-y^2)}}, \quad a > b > y > 0.$$