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

T3.14A. Integrands of the form $\dfrac{1}{\sqrt{(a^2 \pm x^2)^5\,(b^2 \pm x^2)}}$ on the interval (y, ∞).

Notation used: $\beta = \arctan \dfrac{a}{y}, \quad \xi = \arcsin \sqrt{\dfrac{a^2+b^2}{a^2+y^2}}, \quad \nu = \arcsin \dfrac{a}{y},$

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

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

2. $$\int_y^\infty \frac{dx}{\sqrt{(x^2+a^2)(x^2+b^2)^5}} = \frac{1}{3ab^4(a^2-b^2)^2}\{2a^2(a^2-2b^2)E(\beta,\, q) + b^2(3b^2-a^2)F(\beta,\, q)\} - \frac{y[b^2(3a^2-4b^2)+y^2(2a^2-3b^2)]}{3b^4(a^2-b^2)\sqrt{(y^2+a^2)(y^2+b^2)^3}}, \quad a > b,\ y \geq 0.$$

3. $$\int_y^\infty \frac{dx}{\sqrt{(a^2+x^2)^5(x^2-b^2)}} = \frac{1}{3a^4\sqrt{(a^2+b^2)^3}}\left\{(3a^2+2b^2)F(\xi,\, s) - (4a^2+2b^2)E(\xi,\, s)\right\} + \frac{y}{3a^2(a^2+b^2)}\sqrt{\frac{y^2-b^2}{(a^2+y^2)^3}}, \quad y > b > 0.$$

4. $$\int_y^\infty \frac{dx}{\sqrt{(a^2+x^2)(x^2-b^2)^5}} = \frac{1}{3b^4\sqrt{(a^2+b^2)^3}}\left\{(2a^2+4b^2)E(\xi,\, s) - b^2F(\xi,\, s)\right\} + \frac{y[(3a^2+4b^2)b^2-(2a^2+3b^2)y^2]}{3b^4(a^2+b^2)\sqrt{(a^2+y^2)(y^2-b^2)^3}}, \quad y > b > 0.$$

5. $$\int_y^\infty \frac{dx}{\sqrt{(x^2-a^2)(x^2-b^2)^5}} = \frac{(4b^2-2a^2)a}{3b^4(a^2-b^2)^2}E(\nu,\,t) + \frac{2a^2-3b^2}{3ab^4(a^2-b^2)}F(\nu,\,t)$$
$$-\frac{(3b^2-a^2)y^2-(4b^2-2a^2)b^2}{3b^2y(a^2-b^2)^2(y^2-b^2)}\sqrt{\frac{y^2-a^2}{y^2-b^2}}, \quad y \geq a > b > 0.$$

6. $$\int_y^\infty \frac{dx}{\sqrt{(x^2-a^2)^5(x^2-b^2)}} = \frac{1}{3a^3(a^2-b^2)^2}\left\{(4a^2-2b^2)E(\nu,\,t)-(a^2-b^2)F(\nu,\,t)\right\}$$
$$+\frac{(4a^2-2b^2)a^2+(b^2-3a^2)y^2}{3a^2y(a^2-b^2)^2(y^2-a^2)}\sqrt{\frac{y^2-b^2}{y^2-a^2}}, \quad y > a > b > 0.$$