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

T3.16A. Integrands of the form $\dfrac{1}{\sqrt{x^4+2b^2x^2+a^4}}$, $\dfrac{1}{(x^2+a^2)\sqrt{x^4+2b^2x^2+a^4}}$, $\dfrac{(x^2\pm a^2)}{\sqrt{x^4+2b^2x^2+a^4}}$, $\dfrac{(x^2\pm a^2)}{(x^2+a^2)\sqrt{x^4+2b^2x^2+a^4}}$, $\dfrac{\sqrt{x^4+2b^2x^2+a^4}}{(x^2\pm a^2)}$, and $\dfrac{(x^2\pm a^2)}{[x^4+2p^2x^2+q^4]\sqrt{x^4+2b^2x^2+a^4}}$ on the interval (y,∞).

Notation used: $\alpha = \arccos\dfrac{y^2-a^2}{y^2+a^2}$, $r = \dfrac{\sqrt{a^2-b^2}}{a\sqrt{2}}$.

1. $$\int_y^\infty \frac{dx}{\sqrt{x^4+2b^2x^2+a^4}} = \frac{1}{2a}F(\alpha,\, r), \quad a^2>b^2>-\infty, \quad a^2>0,\ y\ge 0.$$

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

3. $$\int_y^\infty \frac{x^2\,dx}{(x^2+a^2)^2\sqrt{x^4+2b^2x^2+a^4}} = \frac{1}{4a(a^2-b^2)}[F(\alpha,\, r)-E(\alpha,\, r),$$
$$a^2>b^2>-\infty, \quad a^2>0,\ y\ge 0.$$

4. $$\int_y^\infty \frac{x^2\,dx}{(x^2-a^2)^2\sqrt{x^4+2b^2x^2+a^4}} = \frac{y\sqrt{y^4+2b^2y^2+a^4}}{2(a^2+b^2)(y^4-a^4)} - \frac{1}{4a(a^2+b^2)}E(\alpha,\, r),$$
$$a^2>b^2>-\infty,\ y^2>a^2>0.$$

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

6. $$\int_y^\infty \frac{(x^2-a^2)^2\,dx}{\sqrt{(x^4+2b^2x^2+a^4)^3}} = \frac{a}{a^2-b^2}[F(\alpha,\,r)-E(\alpha,\,r)] + \frac{y^2-a^2}{y^2\,a^2}\frac{y}{\sqrt{y^4+2b^2y^2+a^4}},$$
$$|b^2|<a^2,\ y\ge 0.$$

7. $$\int_y^\infty \frac{(x^2+a^2)^2\,dx}{\sqrt{(x^2+2b^2x^2+a^4)^3}} = \frac{a}{a^2+b^2}E(\alpha,\,r) - \frac{a^2-b^2}{a^2+b^2}\cdot\frac{y^2-a^2}{y^2+a^2}\,\frac{y}{\sqrt{y^4+2b^2y^2+a^4}},$$
$$|b^2|<a^2,\ y\ge 0.$$

8. $$\int_y^\infty \frac{(x^2-a^2)^2\,dx}{(x^2+a^2)^2\sqrt{x^4+2b^2x^2+a^4}} = \frac{a}{a^2-b^2}E(\alpha,\,r) - \frac{a^2+b^2}{2a(a^2-b^2)}F(\alpha,\,r),$$
$$a^2>b^2>-\infty,\ a^2>0,\ y\ge 0.$$

9. $$\int_y^\infty \frac{\sqrt{x^4+2b^2x^2+a^4}}{(x^2+a^2)^2}\,dx = \frac{1}{2a}E(\alpha,\,r),\quad a^2>b^2>-\infty,\ a^2>0,\ y\ge 0.$$

10. $$\int_y^\infty \frac{\sqrt{x^4+2b^2x^2+a^4}}{(x^2-a^2)^2}\,dx = \frac{1}{2a}[F(\alpha,\,r)-E(\alpha,\,r)] + \frac{y}{y^4-a^4}\sqrt{y^4+2b^2y^2+a^4},$$
$$a>b>0,\ y>a.$$

11. $$\int_y^\infty \frac{(x^2+a^2)^2\,dx}{[(x^2+a^2)^2-4a^2p^2x^2]\sqrt{x^4+2b^2x^2+a^4}} = \frac{1}{2a}\Pi(\alpha,\,p^2,\,r),\quad a>b>0,\ y\ge 0.$$