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

T2.55B. Integrands involving product of trigonometric functions of linear and quadratic arguments and sum of powers and square roots of $(a+b\,x^n)$ on the interval $(0,y)$.

1. $$\int_0^y \frac{\sin(a^2x^2)}{\sqrt{y^4-x^4}}\,dx = \frac{a}{4}\sqrt{\frac{\pi^3}{2}}\left[J_{1/4}\left(\frac{a^2y^2}{2}\right)\right]^2, \quad a>0.$$

2. $$\int_0^y \frac{(y^2-x^2)^{\mu-1}}{x^{2\mu}}\,\sin\frac{a}{x}\,dx = \frac{\sqrt{\pi}}{2}\left(\frac{2}{a}\right)^{\mu-1/2} y^{\mu-3/2}\Gamma(\mu)J_{1/2-\mu}\left(\frac{a}{y}\right),$$
$$a>0,\ y>0,\ 0<\Re\{\,\mu\}<1.$$

3. $$\int_0^y \frac{\cos(p\sqrt{y^2-x^2})}{\sqrt{y^2-x^2}}\,\cos bx\,dx = \frac{\pi}{2}\,J_0\left(y\sqrt{b^2+p^2}\right).$$

4. $$\int_0^y \frac{\sin(p\sqrt{y^2-x^2})}{\sqrt[4]{(y^2-x^2)^3}}\,\cos bx\,dx = \sqrt{\frac{\pi^3p}{8}}\,J_{1/4}\left[\frac{y}{2}(\sqrt{b^2+p^2}-b)\right]J_{1/4}\left[\frac{y}{2}(\sqrt{b^2+p^2}+b)\right],$$
$$b>0,\ p>.$$

5. $$\int_0^y \frac{\cos\left(p\sqrt{y^2-x^2}\right)}{\sqrt[4]{(y^2-x^2)^3}}\,\cos bx\,dx = \sqrt{\frac{\pi^3p}{8}}\,J_{-1/4}\left[\frac{y}{2}(\sqrt{p^2+b^2}-b)\right]J_{-1/4}\left[\frac{y}{2}(\sqrt{p^2+b^2}+b)\right],$$
$$y>0,\ p>0.$$

6. $$\int_0^y \frac{\cos\,(p\sqrt{y^4-x^4})}{\sqrt{y^4-x^4}}\,\cos bx^2\,dx = \frac{1}{2}\sqrt{b\left(\frac{\pi}{2}\right)^3}\,J_{-1/4}\left[\frac{y^2}{2}(\sqrt{p^2+b^2}-p)\right]J_{-1/4}\left[\frac{y^2}{2}(\sqrt{p^2+b^2}+p)\right],$$
$$p>0,\ b>0.$$
