C4282

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

**T3.64A.** Integrands involving trigonometric and inverse trigonometric functions on the interval $(0, \infty)$.

1. $$\int_0^\infty \left( \frac{2}{\pi} \operatorname{arccot} x - \cos px \right) dx = \gamma_e + \ln p, \quad p > 0.$$

2. $$\int_0^\infty \operatorname{arccot} qx \, \sin px \, dx = \frac{\pi}{2q} \left( 1 - e^{-p/q} \right), \quad p > 0, \ q > 0.$$

3. $$\int_0^\infty \operatorname{arccot} qx \, \cos px \, dx = \frac{1}{2p} \left[ e^{-p/q} \operatorname{Ei}(p/q) - e^{p/q} \operatorname{Ei}(-p/q) \right], \quad p > 0, \ q > 0.$$

4. $$\int_0^\infty \operatorname{arccot} sx \, \frac{\sin px \, dx}{1 \pm 2q \cos px + q^2} = \begin{cases} \pm \dfrac{\pi}{2pq} \ln \dfrac{1 \pm q}{1 \pm q \, e^{-p/s}}, & p^2 < 1, \ s > 0, \ p > 0, \\ \pm \dfrac{\pi}{2pq} \ln \dfrac{q \pm 1}{q \pm \, e^{-p/s}}, & q^2 > 1, \ s > 0, \ p > 0. \end{cases}$$

5. $$\int_0^\infty \operatorname{arccot} px \, \frac{\tan x \, dx}{q^2 \cos^2 x + s^2 \sin^2 x} = \frac{\pi}{2s^2} \ln \left( 1 + \frac{s}{q} \tanh(1/p) \right), \quad p > 0, \ q > 0, \ s > 0.$$

6. $$\int_0^\infty \arctan \left( \frac{2a}{x} \right) \sin(bx) \, dx = \frac{\pi}{b} e^{-ab} \sinh(ab), \quad \Re\{a\} > 0, \ b > 0.$$

7. $$\int_0^\infty \arctan \left( \frac{a}{x} \right) \cos(bx) \, dx = \frac{1}{2b} \left[ e^{-ab} \operatorname{Ei}(ab) - e^{ab} \operatorname{Ei}(-ab) \right], \quad a > 0, \ b > 0.$$

8. $$\int_0^\infty \arctan \left( \frac{2ax}{x^2 + c^2} \right) \sin(bx) \, dx = \frac{\pi}{b} e^{-b\sqrt{a^2 + c^2}} \sinh(ab), \quad b > 0.$$

9. $$\int_0^\infty \arctan \left( \frac{2}{x^2} \right) \cos(bx) \, dx = \frac{\pi}{b} e^{-b} \sin(b), \quad b > 0.$$

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