

C4282

! For an efficient use of these tables, first read [HowTo.pdf](#).

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T3.61B. Integrands involving arctan, arccot and rational functions on the interval $(-\infty, \infty)$.

$$1. \int_{-\infty}^{\infty} \frac{x \arctan(\alpha x) dx}{(x^2 + \beta^2)(x^2 + \gamma^2)} = \begin{cases} \frac{\pi}{\beta^2 - \gamma^2} \ln \left(\frac{1 + |\alpha\beta|}{1 + |\alpha\gamma|} \right) \operatorname{sgn}(\alpha), & \alpha, \beta, \gamma \text{ real}; \beta \neq \gamma, \\ \frac{\pi\alpha}{2|\beta|(1 + |\alpha\beta|)}, & \beta = \gamma. \end{cases}$$

$$2. \int_{-\infty}^{\infty} \frac{x \arctan(\alpha/x) dx}{(x^2 + \beta^2)(x^2 + \gamma^2)} = \begin{cases} \frac{\pi}{\beta^2 - \gamma^2} \ln \left(\frac{1 + |\alpha/\gamma|}{1 + |\alpha/\beta|} \right) \operatorname{sgn}(\alpha), & \alpha, \beta, \gamma \text{ real}; \beta \neq \gamma, \\ \frac{\pi\alpha}{2\beta^2(|\beta| + |\alpha|)}, & \beta = \gamma. \end{cases}$$

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