Reduction Formulae

Type 1	Type 2	Type 3	Type 4	Type 5
$I_n = \cdots I_{n-1}$	$I_n = \cdots I_{n-2}$	$\int \tan^{\mathrm{n}} x \, dx = \int \tan^2 x \tan^{n-2} x \, dx$	$[f(x)]^n = f(x)[f(x)]^{n-1}$	$\int \frac{\sin nx}{\sin x} dx$
$I_n = \int_0^1 x^n e^x \, dx$ $I_n = \int_0^1 x^n e^{-x} \, dx$ $I_n = \int_1^2 x(\ln x)^n \, dx$ $I_n = \int_0^1 x^n \sqrt{1-x} \, dx$ $I_n = \int_0^1 \frac{x^n}{\sqrt{1-x}} dx$ $I_n = \int_1^e (\ln x)^n \, dx$ $I_n = \int_0^1 (1+x^2)^n \, dx$	$I_n = \int_0^{\frac{\pi}{2}} x^n \sin x \, dx$ $I_n = \int_0^{\frac{\pi}{2}} x^n \cos x \, dx$ $I_n = \int \cosh^{\mathrm{n}} x \, dx$	$I_n = \int \tan^{\mathrm{n}} x \, dx$ $I_n = \int \cot^{\mathrm{n}} x \, dx$ $I_n = \int \tanh^{\mathrm{n}} x \, dx$ $I_n = \int \coth^{\mathrm{n}} x \, dx$	$I_n = \int_0^{\pi} \sin^{\mathrm{n}} x \, dx$ $I_n = \int_0^{\pi} \cos^{\mathrm{n}} x \, dx$ $I_n = \int_0^1 x^n \sqrt{1-x^2} \, dx$	$I_n = \int_0^{\pi} \frac{\sin nx}{\sin x} dx$ $I_n = \int_0^{\pi} \frac{\cos nx}{\cos x} dx$ $I_n = \int_0^{\ln 2} \frac{\sinh nx}{\sinh x} dx$ $I_n = \int_0^{\ln 2} \frac{\cosh nx}{\cosh x} dx$

Reduction Formulae - answers

Type 1	Type 2	Type 3	Type 4	Type 5
$I_n = \cdots I_{n-1}$	$I_n = \cdots I_{n-2}$	$\int \tan^{\mathrm{n}} x\, dx$ $= \int \tan^2 x \tan^{n-2} x\, dx$	$[f(x)]^n$ $= f(x)[f(x)]^{n-1}$	$\int \frac{\sin nx}{\sin x} dx$
$I_n = e - nI_{n-1}$ $I_n = -x^n e^{-x} + nI_{n-1}$ $I_n = 2(\ln 2)^n - \frac{n}{2} I_{n-1}$ $I_n = \frac{2n}{2n+3} I_{n-1}$ $I_n = \frac{2n}{2n+1} I_{n-1}$ $I_n = e - nI_{n-1}$ $I_n = \frac{2^n + 2nI_{n-1}}{2n+1}$	$I_n = -x^n \cos x$ $+nx^{n-1} \sin x$ $-n(n-1)I_{n-2}$ $I_n = \left(\frac{\pi}{2}\right)^n$ $-n(n-1)I_{n-2}$ $I_n =$ $\frac{1}{n} sinh\, x\, cosh^{n-1}\, x$ $+\frac{n-1}{n} I_{n-2}$	$I_n = \frac{1}{n-1} \tan^{\mathrm{n-1}} x$ $-I_{n-2}$ $I_n = \frac{\cot^{\mathrm{n-1}} x}{n-1} - I_{n-2}$ $I_n = I_{n-2}$ $-\frac{1}{n-1} \tanh^{\mathrm{n-1}} x$ $I_n = \cdots$	$I_n = \frac{n-1}{n} I_{n-2}$ $I_n = \frac{n-1}{n} I_{n-2}$ $I_n = \frac{n-1}{n+2} I_{n-2}$	I_{n+2} $= \frac{2\, sin(n+1)x}{n+1} + I_n$ $I_n = \int_0^{\pi} \frac{\cos nx}{\cos x} dx$ $I_n = \int_0^{\ln 2} \frac{\sinh nx}{\sinh x} dx$ $I_n = \int_0^{\ln 2} \frac{\cosh nx}{\cosh x} dx$