

9.4 Integrals of Trigonometric Functions

$$962. \int \sin x dx = -\cos x + C$$

$$963. \int \cos x dx = \sin x + C$$

$$964. \int \sin^2 x dx = \frac{x}{2} - \frac{1}{4} \sin 2x + C$$

$$965. \int \cos^2 x dx = \frac{x}{2} + \frac{1}{4} \sin 2x + C$$

$$966. \int \sin^3 x dx = \frac{1}{3} \cos^3 x - \cos x + C = \frac{1}{12} \cos 3x - \frac{3}{4} \cos x + C$$

$$967. \int \cos^3 x dx = \sin x - \frac{1}{3} \sin^3 x + C = \frac{1}{12} \sin 3x + \frac{3}{4} \sin x + C$$

$$968. \int \frac{dx}{\sin x} = \int \csc x dx = \ln \left| \tan \frac{x}{2} \right| + C$$

$$969. \int \frac{dx}{\cos x} = \int \sec x dx = \ln \left| \tan \left(\frac{x}{2} + \frac{\pi}{4} \right) \right| + C$$

$$970. \int \frac{dx}{\sin^2 x} = \int \csc^2 x dx = -\cot x + C$$

$$971. \int \frac{dx}{\cos^2 x} = \int \sec^2 x dx = \tan x + C$$

$$972. \int \frac{dx}{\sin^3 x} = \int \csc^3 x dx = -\frac{\cos x}{2 \sin^2 x} + \frac{1}{2} \ln \left| \tan \frac{x}{2} \right| + C$$

$$973. \int \frac{dx}{\cos^3 x} = \int \sec^3 x \, dx = \frac{\sin x}{2\cos^2 x} + \frac{1}{2} \ln \left| \tan \left(\frac{x}{2} + \frac{\pi}{4} \right) \right| + C$$

$$974. \int \sin x \cos x \, dx = -\frac{1}{4} \cos 2x + C$$

$$975. \int \sin^2 x \cos x \, dx = \frac{1}{3} \sin^3 x + C$$

$$976. \int \sin x \cos^2 x \, dx = -\frac{1}{3} \cos^3 x + C$$

$$977. \int \sin^2 x \cos^2 x \, dx = \frac{x}{8} - \frac{1}{32} \sin 4x + C$$

$$978. \int \tan x \, dx = -\ln |\cos x| + C$$

$$979. \int \frac{\sin x}{\cos^2 x} \, dx = \frac{1}{\cos x} + C = \sec x + C$$

$$980. \int \frac{\sin^2 x}{\cos x} \, dx = \ln \left| \tan \left(\frac{x}{2} + \frac{\pi}{4} \right) \right| - \sin x + C$$

$$981. \int \tan^2 x \, dx = \tan x - x + C$$

$$982. \int \cot x \, dx = \ln |\sin x| + C$$

$$983. \int \frac{\cos x}{\sin^2 x} \, dx = -\frac{1}{\sin x} + C = -\csc x + C$$

$$984. \int \frac{\cos^2 x}{\sin x} \, dx = \ln \left| \tan \frac{x}{2} \right| + \cos x + C$$

$$985. \int \cot^2 x \, dx = -\cot x - x + C$$

$$986. \int \frac{dx}{\cos x \sin x} = \ln|\tan x| + C$$

$$987. \int \frac{dx}{\sin^2 x \cos x} = -\frac{1}{\sin x} + \ln\left|\tan\left(\frac{x}{2} + \frac{\pi}{4}\right)\right| + C$$

$$988. \int \frac{dx}{\sin x \cos^2 x} = \frac{1}{\cos x} + \ln\left|\tan \frac{x}{2}\right| + C$$

$$989. \int \frac{dx}{\sin^2 x \cos^2 x} = \tan x - \cot x + C$$

$$990. \int \sin mx \sin nx \, dx = -\frac{\sin(m+n)x}{2(m+n)} + \frac{\sin(m-n)x}{2(m-n)} + C, \\ m^2 \neq n^2.$$

$$991. \int \sin mx \cos nx \, dx = -\frac{\cos(m+n)x}{2(m+n)} - \frac{\cos(m-n)x}{2(m-n)} + C, \\ m^2 \neq n^2.$$

$$992. \int \cos mx \cos nx \, dx = \frac{\sin(m+n)x}{2(m+n)} + \frac{\sin(m-n)x}{2(m-n)} + C, \\ m^2 \neq n^2.$$

$$993. \int \sec x \tan x \, dx = \sec x + C$$

$$994. \int \csc x \cot x \, dx = -\csc x + C$$

$$995. \int \sin x \cos^n x \, dx = -\frac{\cos^{n+1} x}{n+1} + C$$

$$996. \int \sin^n x \cos x \, dx = \frac{\sin^{n+1} x}{n+1} + C$$

$$997. \int \arcsin x \, dx = x \arcsin x + \sqrt{1-x^2} + C$$

$$998. \int \arccos x \, dx = x \arccos x - \sqrt{1-x^2} + C$$

$$999. \int \arctan x \, dx = x \arctan x - \frac{1}{2} \ln(x^2 + 1) + C$$

$$1000. \int \operatorname{arc cot} x \, dx = x \operatorname{arc cot} x + \frac{1}{2} \ln(x^2 + 1) + C$$