1 Integral formulas

Indefinite integrals:

$$\int \cos(\omega x)dx = \frac{1}{\omega}\sin(\omega x) + C$$

$$\int \sin(\omega x)dx = -\frac{1}{\omega}\cos(\omega x) + C$$

$$\int \frac{dx}{x^2+a} = \frac{1}{\sqrt{a}}\arctan(\frac{x}{\sqrt{a}}) + C$$

$$\int \frac{dx}{\sqrt{a-x^2}} = \arcsin(\frac{x}{\sqrt{a}}) + C$$

$$\int \frac{dx}{\sqrt{x^2+b}} = \ln|x+\sqrt{x^2+b}| + C$$

$$\int \frac{f'(x)}{f(x)}dx = \ln|f(x)| + C$$

$$\int a^x dx = \frac{a^x}{\ln a} + C$$

$$\int e^{\omega x}dx = \frac{1}{\omega}e^{\omega x} + C$$

$$\int \tan(\omega x)dx = -\frac{1}{\omega}ln|\cos(\omega x)| + C$$

$$\int \cot(\omega x)dx = \frac{1}{\omega}ln|\sin(\omega x)| + C$$

$$\int \frac{dx}{\cos^2(\omega x)} = \frac{1}{\omega}\tan(\omega x) + C$$

$$\int \frac{dx}{\sin^2(\omega x)} = -\frac{1}{\omega}\cot(\omega x) + C$$

$$\int \frac{dx}{\sin x} = (\frac{Pythagorean - identity}{double - angle}) = \ln|\tan(\frac{x}{2})| + C$$

$$\int \frac{dx}{\cos x} = |t = x + \frac{\pi}{2}| = \ln|\tan(\frac{x}{2} + \frac{\pi}{4})| + C$$

Useful trigonometric identities:

$$\sin 2\alpha = 2\sin\alpha\cos\alpha$$

$$\cos 2\alpha = \cos^2\alpha - \sin^2\alpha$$

Definite integrals:

$$\int_a^b f(x)dx = F(b) - F(a)$$

$$V = \int_a^b \pi(f(x))^2 dx$$

$$\int_a^b f(x)dx = -\int_b^a f(x)dx$$

$$l = \int_{x1}^{x2} \sqrt{(y'x)^2 + 1}dx$$