Műszaki matematika puska

$$\int x^\alpha dx = \frac{x^{\alpha+1}}{\alpha+1} + C,\ (\alpha \neq -1), \quad \int \frac{1}{x} dx = \ln|x| + C,$$
$$\int \cos x dx = \sin x + C, \quad \int \sin x dx = -\cos x + C, \quad \int \frac{1}{\cos^2 x} dx = \operatorname{tg} x + C,$$
$$\int \frac{1}{\sin^2 x} dx = -\operatorname{ctg} x + C, \quad \int \frac{1}{x^2+1} dx = \operatorname{arctg} x + C = -\operatorname{arcctg} x + C,$$
$$\int \frac{1}{\sqrt{1-x^2}} dx = \arcsin x + C = -\arccos x + C, \int e^x dx = e^x + C, \quad \int a^x dx = \frac{a^x}{\ln a} + C\ .$$

$$L[f](p) := \int_0^\infty f(x) e^{-px} dx, \quad L[e^{ax} f(x)](p) = L[f(x)](p-a), \quad L[xf(x)](p) = -L'[f(x)](p), \quad L[x^n](p) = \frac{n!}{p^{n+1}},$$
$$L[\cos ax](p) = \frac{p}{p^2+a^2}, \quad L[\sin ax](p) = \frac{a}{p^2+a^2}, \quad L[y'] = pL[y] - y(0), \quad L[y''] = p^2 L[y] - py(0) - y'(0),$$

$$\sum_{n=1}^{\infty} \frac{1}{n^p} < \infty \iff p > 1, \quad \sum_{n=0}^{\infty} x^n = \frac{1}{1-x} \iff |x| < 1, \quad (1+x)^\alpha = \sum_{n=0}^{\infty} \binom{\alpha}{n} x^n \iff |x| < 1,$$

$$\sum_{n=1}^{\infty} (-1)^n a_n \approx \sum_{n=1}^{k-1} (-1)^n a_n\ , \qquad \sum_{n=1}^{\infty} a_n \approx \sum_{n=1}^{k-1} a_n + \frac{1}{2} a_k + \int_k^\infty f(x) dx.$$

$$\tilde{f}(x) = a_0 + \sum_{n=1}^{\infty} (a_n \cos nx + b_n \sin nx)\,, \quad a_0 := \frac{1}{2\pi} \int_{-\pi}^{\pi} f(x) dx,$$
$$a_n := \frac{1}{\pi} \int_{-\pi}^{\pi} f(x) \cos nx dx, \quad b_n := \frac{1}{\pi} \int_{-\pi}^{\pi} f(x) \sin nx dx$$

$$z = x + iy, \quad f(z) = u(x,y) + iv(x,y), \quad u'_x = v'_y,\ -u'_y = v'_x, \quad u''_{xx} + u''_{yy} = 0$$
$$\int_L f(z) dz = \int_\alpha^\beta f(z(t)) z'(t) dt$$
$$f(z) = \sum_{n=-\infty}^{\infty} c_n (z - z_0)^n, \quad c_n = \frac{1}{2\pi i} \oint_\gamma \frac{f(z)}{(z-z_0)^{n+1}} dz, \quad c_{-1} = \frac{1}{2\pi i} \oint_\gamma f(z) dz.$$

$$c_k := \frac{1}{2\pi} \int_{-\pi}^{\pi} f(x) e^{-ikx}\ dx, \quad \hat{f}(x) := \sum_{k=-\infty}^{\infty} c_k e^{ikx}, \quad \hat{F}(\omega) := \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\infty} f(x) e^{-i\omega x}\ dx$$