确定会给的公式表

$$\Gamma(z)\Gamma(1-z) = \frac{\pi}{\sin(\pi z)}, \tag{1}$$

$$J_\nu(x) = \sum_{k=0}^{\infty} \frac{(-1)^k}{k!\Gamma(k+\nu+1)} \left(\frac{x}{2}\right)^{2k+\nu}, \tag{2}$$

$$N_\nu(x) = \lim_{\alpha\to\nu} \frac{J_\alpha(x)\cos(\alpha\pi) - J_{-\alpha}(x)}{\sin(\alpha\pi)}, \tag{3}$$

$$J_m(x) = \frac{1}{2\pi}\int_{-\pi}^{\pi} e^{i(x\sin\theta - m\theta)} d\theta,\ (m \in Z), \tag{4}$$

$$e^{\frac{x}{2}(t-\frac{1}{t})} = \sum_{n=-\infty}^{\infty} J_n(x) t^n, \tag{5}$$

$$\int_0^1 x\, J_m(\mu_i x) J_m(\mu_j x)\, dx = \delta_{ij} \frac{[J_{m+1}(\mu_i)]^2}{2}, (\text{这里}\mu_1, \mu_2, \ldots \text{是}J_m\text{的正实数零点}), \tag{6}$$

$$\int_0^1 x\, J_m(\lambda_i x) J_m(\lambda_j x) dx = \delta_{ij} \frac{\left(1 - \frac{m^2}{\lambda_i^2}\right)[J_m(\lambda_i)]^2}{2}, (\text{这里}\lambda_1, \lambda_2, \ldots \text{是}J_m'\text{的正实数零点}), \tag{7}$$

$$\int_0^\infty J_m(k_1 r) J_m(k_2 r) r dr = \frac{\delta(k_1 - k_2)}{k_1},\ (k_1, k_2 > 0), \tag{8}$$

$$Y_{\ell m}(\theta, \phi) = \frac{1}{2^\ell \ell!}\sqrt{\frac{(2\ell+1)}{4\pi}\frac{(\ell-m)!}{(\ell+m)!}} \left[\sin^m\theta \left(\frac{1}{\sin\theta}\frac{d}{d\theta}\right)^{\ell+m} \sin^{2\ell}\theta\right] e^{im\phi}, \tag{9}$$

$$j_\ell(x) = \sqrt{\frac{\pi}{2x}} J_{\ell+1/2}(x), \tag{10}$$

$$n_\ell(x) = \sqrt{\frac{\pi}{2x}} N_{\ell+1/2}(x), \tag{11}$$

$$j_l(x) = (-x)^l \left(\frac{1}{x}\frac{d}{dx}\right)^l \frac{\sin x}{x}, \tag{12}$$

$$n_l(x) = -(-x)^l \left(\frac{1}{x}\frac{d}{dx}\right)^l \frac{\cos x}{x}, \tag{13}$$

$$P_\ell(x) = \sum_{k=0}^{\ell} \frac{(\ell+k)!}{(k!)^2(\ell-k)!} \left(\frac{x-1}{2}\right)^k, \tag{14}$$

$$P_\ell(\cos\theta) = \sqrt{\frac{4\pi}{2\ell+1}} Y_{\ell 0}(\theta, \phi), \tag{15}$$

$$P_\ell(x) = \frac{1}{2^\ell \ell!}\frac{d^\ell}{dx^\ell}(x^2-1)^\ell, \tag{16}$$

$$(2\ell+1)xP_\ell(x) = (\ell+1)P_{\ell+1}(x) + \ell P_{\ell-1}(x), \tag{17}$$

$$\frac{1}{\sqrt{1+t^2-2xt}} = \sum_{\ell=0}^{\infty} P_\ell(x) t^\ell,\ (t < |x \pm \sqrt{x^2-1}|), \tag{18}$$

$$P_\ell(\mathbf{n}_1 \cdot \mathbf{n}_2) = \frac{4\pi}{2\ell+1}\sum_{m=-\ell}^{\ell} Y_{\ell m}^*(\mathbf{n}_1) Y_{\ell m}(\mathbf{n}_2), \tag{19}$$