① $$\sigma(\tau, z) = z \prod_{\substack{\gamma \in \mathbb{Z}\tau + \mathbb{Z} \\ \gamma \neq 0}} \left(1 - \frac{z}{\gamma}\right) \exp\left(\frac{z}{\gamma} + \frac{1}{2} \frac{z^2}{\gamma^2}\right)$$

$$= \exp\left(\frac{+\pi^2}{6} E_2(\tau) z^2\right) \frac{\theta\left(\tau, z + \frac{1+\tau}{2}\right) q^{\frac{1}{8}} \zeta^{\frac{1}{2}}}{2\pi i \, \eta^3}$$

$$\theta(\tau, z) = \sum_{r \in \mathbb{Z}} q^{r^2} \zeta^r$$

② $$\mathfrak{M}_k(m) = \bigoplus_{\ell d^2 | m} M_k^{new}\left(\frac{m}{\ell d^2}\right) \Big| V_d \sum_{t | \ell} t^{k/2} V_t, \text{ where } V_t : f(\tau) \to f(t\tau).$$

③ $$C(\Delta, r) = \sum_{\substack{s, t \in \mathbb{Z} \\ (m_1 s - m_2 t) = \Delta \\ m_1 s + m_2 t = r}} (m_1 s - (m_2 t)) =$$