Jacobi $r^k_n = \sharp n = k$ squares

$$ {}^{2\tau}\Theta^k = \sum_n^{\mathbb{N}} r^k_n \, {}^{2\pi i\tau}\mathfrak{e}^n $$

Eisenstein $\eta^s_n = \sum_{ab=n} \left(\frac{a}{b}\right)^s$

Riemann ${}_n\mathbb{Q} = \sharp\frac{\mathfrak{n} \triangleleft \mathbb{Z}}{\underline{\mathfrak{n}} = n} = 1$

Dedekind $Q \sqsubset \mathbb{Q}$

$$ {}_nQ = \sharp\frac{\mathfrak{n} \triangleleft Z}{\underline{\mathfrak{n}} = n} $$

$$ {}_pQ = Q/\mathbb{Q} \Leftrightarrow p \in Q \text{ split=unramified} $$

$$ {}_pQ = 1 \Leftrightarrow p \text{ totally ramified} $$

$$ \mathbb{Z} \overset{\times}{\neg} \mathbb{Z}q \xrightarrow[\text{hom}]{\chi} \mathbb{C}^\times $$

$$ {}_{mn}\chi = {}_m\chi \, {}_n\chi $$

$$ \alpha(d) = d^k $$

$$\iota_m \, \iota_n = \sum_{m \succ d \prec n} d^k \, \iota_{mn/d^2}$$

$$m \curlywedge n = 1 \Longrightarrow \iota_m \, \iota_n = \iota_{mn}$$

$$\begin{bmatrix} k \\ n \end{bmatrix} = \sum_{m \prec n} m^k$$

$$\begin{bmatrix} k \\ m \end{bmatrix} \begin{bmatrix} k \\ n \end{bmatrix} = \sum_{m \succ d \prec n} d^k \begin{bmatrix} k \\ mn/d^2 \end{bmatrix}$$

$$m \curlywedge n = 1 \Longrightarrow \begin{bmatrix} k \\ m \end{bmatrix} \begin{bmatrix} k \\ n \end{bmatrix} = \begin{bmatrix} k \\ mn \end{bmatrix}$$

$$5040 \sum_{1 \leqslant m < n} \begin{bmatrix} 3 \\ m \end{bmatrix} \begin{bmatrix} 5 \\ n - m \end{bmatrix} = 11 \begin{bmatrix} 9 \\ n \end{bmatrix} - 21 \begin{bmatrix} 5 \\ n \end{bmatrix} + 10 \begin{bmatrix} 3 \\ n \end{bmatrix}$$

$$120 \sum_{1 \leqslant m < n} \begin{bmatrix} 3 \\ m \end{bmatrix} \begin{bmatrix} 3 \\ n - m \end{bmatrix} = \begin{bmatrix} 7 \\ n \end{bmatrix} - \begin{bmatrix} 3 \\ n \end{bmatrix}$$

$$\alpha(1) = 1$$

$$\alpha(m) \, \alpha(n) = \alpha(mn)$$

$$\iota_m \, \iota_n = \sum_{m \succ d \prec n} \alpha(d) \, \iota_{mn/d^2}$$