

SiegelTheta

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Notations

Traditional name

Siegel theta function

Traditional notation

$$\Theta\left(\begin{pmatrix} m_{1,1} & \dots & m_{1,r} \\ \dots & \dots & \dots \\ m_{r,1} & \dots & m_{r,r} \end{pmatrix}, \{s_1, \dots, s_r\}\right)$$

Mathematica StandardForm notation

SiegelTheta[{{m_{1,1}, ..., m_{1,r}}, ..., {m_{r,1}, ..., m_{r,r}}}, {s₁, ..., s_r}]

Primary definition

09.58.02.0001.01

$$\Theta\left(\begin{pmatrix} m_{1,1} & \dots & m_{1,r} \\ \dots & \dots & \dots \\ m_{r,1} & \dots & m_{r,r} \end{pmatrix}, \{s_1, \dots, s_r\}\right) = \sum_{n_1=-\infty}^{\infty} \dots \sum_{n_r=-\infty}^{\infty} e^{i\pi(n\Omega n + 2n\cdot s)} /;$$

$$\Omega = \{\{m_{1,1}, \dots, m_{1,r}\}, \dots, \{m_{r,1}, \dots, m_{r,r}\}\} \wedge s = \{s_1, \dots, s_r\} \wedge n = \{n_1, \dots, n_r\}$$

The Siegel theta function $\Theta(\Omega, s)$ with symmetric Riemann modular matrix $\Omega = \{\{m_{1,1}, \dots, m_{1,r}\}, \dots, \{m_{r,1}, \dots, m_{r,r}\}\}$ with positive definite imaginary part and vector $s = \{s_1, \dots, s_r\}$ is defined through $\sum_{n_1=-\infty}^{\infty} \dots \sum_{n_r=-\infty}^{\infty} e^{i\pi(n\Omega^T n + 2n\cdot s)}$, where Ω^T means transposed to Ω matrix (or vector) and n ranges over all possible vectors in the r -dimensional integer lattice.

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