$$_z^w\vartheta = \sum_\nu^{\mathbb{Z}} \mathfrak{e}^{\pi i\nu w\nu}\,\mathfrak{e}^{2\pi iz\nu}$$

$$w = u + iv \implies iw = iu - v$$

$$z = x + iy \implies iz = ix - y$$

$$\overline{\mathfrak{e}^{\pi in^2w}\mathfrak{e}^{2\pi inz}} = \mathfrak{e}^{-\pi n^2v}\,\mathfrak{e}^{-2\pi ny}$$

$$_{z+\varkappa w+k}^{\qquad w}\vartheta = \mathfrak{e}^{-\pi i\varkappa w\varkappa - 2\pi iz\varkappa}\,_z^w\vartheta$$