

$$m_{i,j \rightarrow k}[Z_] := \text{Module}[\{x, y, z\},$$

$$Z // N_{w_i} c_{j \rightarrow x} // N_{w_x} u_{j \rightarrow y} // \text{ReplaceAll}[\{c_{x|y} \rightarrow c_x, w_j \rightarrow w_y\}] //$$

$$N_{u_i} c_{x \rightarrow x} // \text{ReplaceAll}[z_{-i|j|x|y} \rightarrow z_k] // \text{CF}]$$