

In[*]:= { η , ξ , y , x }*

Out[*]:= { y , x , η , ξ }

In[*]:= $m_{i,j \rightarrow k}$

lhs = $m_{1,2 \rightarrow 1}$ // $m_{1,3 \rightarrow 1}$

rhs = $m_{2,3 \rightarrow 2}$ // $m_{1,2 \rightarrow 1}$

lhs \equiv rhs

Out[*]:= $E_{\{i,j\} \rightarrow \{k\}} [1, y_k (\eta_i + \eta_j) - \eta_j \xi_i + x_k (\xi_i + \xi_j), \in \text{Series}[0, 0]]$

Out[*]:= $E_{\{1,2,3\} \rightarrow \{1\}} [1, y_1 \eta_1 + y_1 \eta_2 + y_1 \eta_3 + x_1 \xi_1 - \eta_2 \xi_1 - \eta_3 \xi_1 + x_1 \xi_2 - \eta_3 \xi_2 + x_1 \xi_3, \in \text{Series}[0, 0]]$

Out[*]:= $E_{\{1,2,3\} \rightarrow \{1\}} [1, y_1 \eta_1 + y_1 \eta_2 + y_1 \eta_3 + x_1 \xi_1 - \eta_2 \xi_1 - \eta_3 \xi_1 + x_1 \xi_2 - \eta_3 \xi_2 + x_1 \xi_3, \in \text{Series}[0, 0]]$

Out[*]:= True

In[*]:= $R_{1,2} \bar{R}_{3,4}$

Out[*]:= $E_{\{\} \rightarrow \{1,2,3,4\}} \left[1, (-1 + T) x_2 (y_1 - y_2) + \left(-1 + \frac{1}{T} \right) x_4 (y_3 - y_4), \right.$
 $\in \text{Series} \left[0, -\frac{1}{2} (1 - T) x_2^2 y_1^2 + x_1 x_2 y_1 y_2 + \frac{1}{2} (1 - 3 T) x_2^2 y_1 y_2 - \right.$
 $\left. \frac{(-1 + T) x_3 x_4 y_3^2}{T^2} - \frac{(1 - T) x_4^2 y_3^2}{2 T^3} - \frac{x_3 x_4 y_3 y_4}{T^2} - \frac{(-1 - T) x_4^2 y_3 y_4}{2 T^3} \right]]$

In[*]:= $(R_{1,2} \bar{R}_{3,4}) // m_{1,3 \rightarrow 1}$

Out[*]:= $E_{\{\} \rightarrow \{1,2,4\}} \left[1, (-1 + T) x_2 y_1 + \frac{(1 - T) x_4 y_1}{T} + (1 - T) x_2 y_2 + \frac{(-1 + T) x_4 y_4}{T}, \right.$
 $\in \text{Series} \left[0, \frac{1}{2} (-1 + T) x_2^2 y_1^2 + \frac{(1 - T) x_1 x_4 y_1^2}{T^2} + \frac{(-1 + T) x_4^2 y_1^2}{2 T^3} + x_1 x_2 y_1 y_2 + \right.$
 $\left. \frac{1}{2} (1 - 3 T) x_2^2 y_1 y_2 + \frac{(-1 + T) x_2 x_4 y_1 y_2}{T} - \frac{x_1 x_4 y_1 y_4}{T^2} + \frac{(1 + T) x_4^2 y_1 y_4}{2 T^3} \right]]$

In[*]:= $m_{2,4 \rightarrow 2}$

Out[*]:= $E_{\{2,4\} \rightarrow \{2\}} [1, y_2 (\eta_2 + \eta_4) - \eta_4 \xi_2 + x_2 (\xi_2 + \xi_4), \in \text{Series}[0, 0]]$

In[*]:= $R_{1,2} \bar{R}_{3,4} // m_{1,3 \rightarrow 1} // m_{2,4 \rightarrow 2} // CF$

Out[*]:= $E_{\{\} \rightarrow \{1,2\}} [1, 0, \in \text{Series}[0, 0]]$

In[*]:= $m_{i,j \rightarrow k}$

lhs = $m_{1,2 \rightarrow 1}$ // $m_{1,3 \rightarrow 1}$

rhs = $m_{2,3 \rightarrow 2}$ // $m_{1,2 \rightarrow 1}$

lhs \equiv rhs

Out[*]:= $E_{\{i,j\} \rightarrow \{k\}} [1, y_k (\eta_i + \eta_j) - \eta_j \xi_i + x_k (\xi_i + \xi_j), \in \text{Series}[0, 0, 0]]$

Out[*]:= $E_{\{1,2,3\} \rightarrow \{1\}} [1, y_1 \eta_1 + y_1 \eta_2 + y_1 \eta_3 + x_1 \xi_1 - \eta_2 \xi_1 - \eta_3 \xi_1 + x_1 \xi_2 - \eta_3 \xi_2 + x_1 \xi_3, \in \text{Series}[0, 0, 0]]$

Out[*]:= $E_{\{1,2,3\} \rightarrow \{1\}} [1, y_1 \eta_1 + y_1 \eta_2 + y_1 \eta_3 + x_1 \xi_1 - \eta_2 \xi_1 - \eta_3 \xi_1 + x_1 \xi_2 - \eta_3 \xi_2 + x_1 \xi_3, \in \text{Series}[0, 0, 0]]$

Out[*]:= True

In[*]:= $\$k = 2$; $R_{1,2}$

Out[*]:= $E_{\{\} \rightarrow \{1,2\}} [1, (-1 + T) x_2 (y_1 - y_2),$

$\in \text{Series}[0, x_1 x_2 y_1^2 c_{1,2} - \frac{1}{2} (1 - T) x_2^2 y_1^2 c_{1,5} + x_1 x_2 y_1 y_2 c_{1,5} + x_2^2 y_1 y_2 (-T c_{1,2} - \frac{1}{2} (-1 + 3T) c_{1,5}),$
 $x_1^3 y_1^3 c_{2,1} + x_1^2 x_2 y_1^3 c_{2,2} + x_1 x_2^2 y_1^3 c_{2,3} + x_2^3 y_1^3 c_{2,4} + x_1^3 y_1^2 y_2 c_{2,5} + x_1^2 x_2 y_1^2 y_2 c_{2,6} +$
 $x_1 x_2^2 y_1^2 y_2 c_{2,7} + x_2^3 y_1^2 y_2 c_{2,8} + x_1^3 y_1 y_2^2 c_{2,9} + x_1^2 x_2 y_1 y_2^2 c_{2,10} + x_1 x_2^2 y_1 y_2^2 c_{2,11} +$
 $x_2^3 y_1 y_2^2 c_{2,12} + x_1^3 y_2^3 c_{2,13} + x_1^2 x_2 y_2^3 c_{2,14} + x_1 x_2^2 y_2^3 c_{2,15} + x_2^3 y_2^3 c_{2,16}]]$

In[*]:= $CF[(R_{1,2} R_{4,3} R_{5,6} // m_{1,4 \rightarrow 1} // m_{2,5 \rightarrow 2} // m_{3,6 \rightarrow 3})[[3]] - (R_{2,3} R_{4,5} R_{1,6} // m_{1,4 \rightarrow 1} // m_{2,5 \rightarrow 2} // m_{3,6 \rightarrow 3})[[3]]]$

Out[*]:= $\in \text{Series}[0, 0, x_2 x_3 y_1 y_2 (-2 T c_{1,2}^2 + c_{1,2} c_{1,5} - 3 T c_{1,2} c_{1,5} + c_{1,5}^2 - T c_{1,5}^2) +$

$\frac{1}{2} x_3^2 y_1^2 (-2 T c_{1,2}^2 + 2 T^2 c_{1,2}^2 + c_{1,2} c_{1,5} - 4 T c_{1,2} c_{1,5} + 3 T^2 c_{1,2} c_{1,5} + c_{1,5}^2 - 2 T c_{1,5}^2 + T^2 c_{1,5}^2) +$
 $x_1^2 x_2 y_1^3 (-3 c_{2,1} + 3 T c_{2,1}) + x_1^2 x_3 y_1^3 (3 T c_{2,1} - 3 T^2 c_{2,1}) + x_1 x_2^2 y_1^3 (-3 c_{2,1} + 6 T c_{2,1} - 3 T^2 c_{2,1}) +$
 $x_1 x_2 x_3 y_1^3 (-2 c_{1,2} c_{1,5} + 2 T c_{1,2} c_{1,5} - 2 c_{2,2} + 4 T c_{2,2} - 2 T^2 c_{2,2} + 2 c_{2,3} - 2 T c_{2,3}) +$
 $x_1 x_3^2 y_1^3 (2 T c_{1,2} c_{1,5} - 2 T^2 c_{1,2} c_{1,5} + 3 T^2 c_{2,1} - 6 T^3 c_{2,1} +$
 $3 T^4 c_{2,1} + 2 T c_{2,2} - 4 T^2 c_{2,2} + 2 T^3 c_{2,2} - 2 T c_{2,3} + 2 T^2 c_{2,3}) +$
 $x_1^3 y_1^2 y_3 (c_{2,5} - T c_{2,5}) + x_1^3 y_1^2 y_2 (-c_{2,5} + T c_{2,5}) + x_1^2 x_3 y_1^2 y_2 (3 T c_{2,5} - 3 T^2 c_{2,5}) +$
 $x_1^2 x_2 y_1^2 y_2 (-3 c_{2,5} + 6 T c_{2,5} - 3 T^2 c_{2,5}) + x_1^2 x_2 y_1^2 y_3 (-3 T c_{2,5} + 3 T^2 c_{2,5}) +$
 $x_1 x_2^2 y_1^2 y_3 (-3 T c_{2,5} + 6 T^2 c_{2,5} - 3 T^3 c_{2,5}) + x_1 x_2^2 y_1^2 y_2 (-3 c_{2,5} + 9 T c_{2,5} - 9 T^2 c_{2,5} + 3 T^3 c_{2,5}) +$
 $x_1 x_2 x_3 y_1^2 y_3 (-c_{1,5}^2 + T c_{1,5}^2 - 2 T c_{2,6} + 2 T^2 c_{2,6}) + x_1 x_2 x_3 y_1^2 y_2$
 $(-2 T c_{1,2}^2 + c_{1,2} c_{1,5} - 3 T c_{1,2} c_{1,5} - c_{1,5}^2 + T c_{1,5}^2 - 2 c_{2,6} + 6 T c_{2,6} - 4 T^2 c_{2,6} + 2 c_{2,7} - 2 T c_{2,7}) +$
 $\frac{1}{2} x_1 x_3^2 y_1^2 y_3 (2 T^2 c_{1,2}^2 - T c_{1,2} c_{1,5} + 3 T^2 c_{1,2} c_{1,5} - c_{1,5}^2 + 4 T c_{1,5}^2 - 3 T^2 c_{1,5}^2 - 2 T c_{2,7} + 2 T^2 c_{2,7}) +$
 $\frac{1}{2} x_1 x_3^2 y_1^2 y_2 (2 T^2 c_{1,2}^2 - T c_{1,2} c_{1,5} + 3 T^2 c_{1,2} c_{1,5} + c_{1,5}^2 - T^2 c_{1,5}^2 + 6 T^2 c_{2,5} -$
 $12 T^3 c_{2,5} + 6 T^4 c_{2,5} + 4 T c_{2,6} - 8 T^2 c_{2,6} + 4 T^3 c_{2,6} - 2 T c_{2,7} + 2 T^2 c_{2,7}) +$
 $x_1^3 y_1 y_3^2 (c_{2,9} - T^2 c_{2,9}) + x_1^3 y_1 y_2^2 (-c_{2,9} + 2 T c_{2,9} - T^2 c_{2,9}) + x_1^3 y_1 y_2 y_3 (-2 T c_{2,9} + 2 T^2 c_{2,9}) +$
 $x_1^2 x_2 y_1 y_2 y_3 (-6 T c_{2,9} + 12 T^2 c_{2,9} - 6 T^3 c_{2,9}) +$
 $x_2^3 y_1^2 y_2 (3 T c_{2,1} - 6 T^2 c_{2,1} + 3 T^3 c_{2,1} - c_{2,5} + 6 T c_{2,5} - 10 T^2 c_{2,5} + 6 T^3 c_{2,5} - T^4 c_{2,5} +$
 $T c_{2,9} - 2 T^2 c_{2,9} + T^3 c_{2,9}) + x_1^2 x_2 y_1 y_2^2 (-3 c_{2,9} + 9 T c_{2,9} - 9 T^2 c_{2,9} + 3 T^3 c_{2,9}) +$
 $x_1^2 x_2 y_1 y_3^2 (-3 T^2 c_{2,9} + 3 T^3 c_{2,9}) + x_1 x_2^2 y_1 y_3^2 (-3 T^2 c_{2,9} + 6 T^3 c_{2,9} - 3 T^4 c_{2,9}) +$

$$\begin{aligned}
& x_1 x_2^2 y_1 y_2^2 (-3 c_{2,9} + 12 T c_{2,9} - 18 T^2 c_{2,9} + 12 T^3 c_{2,9} - 3 T^4 c_{2,9}) + \\
& x_1 x_2^2 y_1 y_2 y_3 (-6 T c_{2,9} + 18 T^2 c_{2,9} - 18 T^3 c_{2,9} + 6 T^4 c_{2,9}) + \\
& x_2^3 y_1 y_2 y_3 (2 T^2 c_{2,5} - 2 T^3 c_{2,5} - 2 T c_{2,9} + 10 T^2 c_{2,9} - 14 T^3 c_{2,9} + 8 T^4 c_{2,9} - 2 T^5 c_{2,9}) + x_2^3 y_1 y_2^2 \\
& (3 T^2 c_{2,1} - 3 T^3 c_{2,1} + T^2 c_{2,5} - T^3 c_{2,5} - c_{2,9} + 5 T c_{2,9} - 10 T^2 c_{2,9} + 10 T^3 c_{2,9} - 5 T^4 c_{2,9} + T^5 c_{2,9}) + \\
& x_1^2 x_3 y_1 y_3^2 (T c_{2,10} - T^2 c_{2,10}) + x_1^2 x_3 y_1 y_2^2 (3 T c_{2,9} - 3 T^2 c_{2,9} + T c_{2,10} - T^2 c_{2,10}) + \\
& x_1^2 x_3 y_1 y_2 y_3 (-2 T c_{2,10} + 2 T^2 c_{2,10}) + x_1 x_2 x_3 y_1 y_2 y_3 (-4 T c_{2,10} + 8 T^2 c_{2,10} - 4 T^3 c_{2,10}) + \\
& \frac{1}{2} x_2^2 x_3 y_1^2 y_2 (6 T c_{1,2}^2 - 8 T^2 c_{1,2}^2 - 3 c_{1,2} c_{1,5} + 19 T c_{1,2} c_{1,5} - 18 T^2 c_{1,2} c_{1,5} - 6 c_{1,5}^2 + \\
& 16 T c_{1,5}^2 - 10 T^2 c_{1,5}^2 + 6 T c_{2,2} - 12 T^2 c_{2,2} + 6 T^3 c_{2,2} - 2 c_{2,6} + 10 T c_{2,6} - 14 T^2 c_{2,6} + \\
& 6 T^3 c_{2,6} + 2 T c_{2,7} - 2 T^2 c_{2,7} + 6 c_{2,8} - 6 T c_{2,8} + 2 T c_{2,10} - 4 T^2 c_{2,10} + 2 T^3 c_{2,10}) + \\
& x_1 x_2^3 y_1 y_2^2 (3 T^2 c_{2,9} - 6 T^3 c_{2,9} + 3 T^4 c_{2,9} + 2 T c_{2,10} - 4 T^2 c_{2,10} + 2 T^3 c_{2,10}) + \\
& x_1 x_2 x_3 y_1 y_3^2 (-2 T^2 c_{2,10} + 2 T^3 c_{2,10}) + \\
& x_2^2 x_3 y_1 y_2 y_3 (T c_{1,5}^2 - T^2 c_{1,5}^2 + 2 T^2 c_{2,6} - 2 T^3 c_{2,6} - 2 T c_{2,10} + 8 T^2 c_{2,10} - 8 T^3 c_{2,10} + 2 T^4 c_{2,10}) + \\
& x_1 x_2 x_3 y_1 y_2^2 (c_{1,5}^2 - T c_{1,5}^2 - 2 c_{2,10} + 8 T c_{2,10} - 8 T^2 c_{2,10} + 2 T^3 c_{2,10} + 2 c_{2,11} - 2 T c_{2,11}) + \\
& x_1 x_2^3 y_1 y_2 y_3 (-T c_{1,5}^2 + T^2 c_{1,5}^2 - 2 T c_{2,11} + 2 T^2 c_{2,11}) + x_2 x_3^2 y_1 y_2 y_3 (-2 T^3 c_{1,2}^2 + T^2 c_{1,2} c_{1,5} - \\
& 3 T^3 c_{1,2} c_{1,5} - T^2 c_{1,5}^2 + T^3 c_{1,5}^2 + 2 T^2 c_{2,7} - 2 T^3 c_{2,7} - 2 T c_{2,11} + 6 T^2 c_{2,11} - 4 T^3 c_{2,11}) + \\
& \frac{1}{2} x_2 x_3^2 y_1^2 y_2 (8 T c_{1,2}^2 - 22 T^2 c_{1,2}^2 + 14 T^3 c_{1,2}^2 - 4 c_{1,2} c_{1,5} + 23 T c_{1,2} c_{1,5} - 40 T^2 c_{1,2} c_{1,5} + \\
& 21 T^3 c_{1,2} c_{1,5} - 4 c_{1,5}^2 + 14 T c_{1,5}^2 - 16 T^2 c_{1,5}^2 + 6 T^3 c_{1,5}^2 + 6 T c_{2,3} - 12 T^2 c_{2,3} + \\
& 6 T^3 c_{2,3} + 2 T^2 c_{2,6} - 4 T^3 c_{2,6} + 2 T^4 c_{2,6} - 2 c_{2,7} + 12 T c_{2,7} - 18 T^2 c_{2,7} + \\
& 8 T^3 c_{2,7} + 6 c_{2,8} - 12 T c_{2,8} + 6 T^2 c_{2,8} + 2 T c_{2,11} - 4 T^2 c_{2,11} + 2 T^3 c_{2,11}) + \\
& \frac{1}{2} x_2^2 x_3 y_1 y_2^2 (6 T^2 c_{1,2}^2 - 3 T c_{1,2} c_{1,5} + 9 T^2 c_{1,2} c_{1,5} + c_{1,5}^2 - 6 T c_{1,5}^2 + 5 T^2 c_{1,5}^2 + \\
& 6 T^2 c_{2,2} - 6 T^3 c_{2,2} + 2 T^2 c_{2,6} - 2 T^3 c_{2,6} - 2 c_{2,10} + 8 T c_{2,10} - 12 T^2 c_{2,10} + \\
& 8 T^3 c_{2,10} - 2 T^4 c_{2,10} + 2 T c_{2,11} - 2 T^2 c_{2,11} + 6 c_{2,12} - 6 T c_{2,12}) + \\
& \frac{1}{2} x_2 x_3^2 y_1 y_2^2 (6 T^2 c_{1,2}^2 - 8 T^3 c_{1,2}^2 - 3 T c_{1,2} c_{1,5} + 7 T^2 c_{1,2} c_{1,5} - 6 T^3 c_{1,2} c_{1,5} - 3 T c_{1,5}^2 + \\
& 4 T^2 c_{1,5}^2 - T^3 c_{1,5}^2 + 6 T^2 c_{2,3} - 6 T^3 c_{2,3} + 2 T^2 c_{2,7} - 2 T^3 c_{2,7} + 2 T^2 c_{2,10} - 4 T^3 c_{2,10} + \\
& 2 T^4 c_{2,10} - 2 c_{2,11} + 10 T c_{2,11} - 14 T^2 c_{2,11} + 6 T^3 c_{2,11} + 6 c_{2,12} - 12 T c_{2,12} + 6 T^2 c_{2,12}) + \\
& x_2^3 y_1 y_2 y_3 (2 T^3 c_{1,2} c_{1,5} - 2 T^4 c_{1,2} c_{1,5} - T^2 c_{1,5}^2 + 4 T^3 c_{1,5}^2 - 3 T^4 c_{1,5}^2 + \\
& 2 T^2 c_{2,8} - 2 T^3 c_{2,8} - 2 T c_{2,12} + 4 T^2 c_{2,12} - 2 T^3 c_{2,12}) + \\
& \frac{1}{2} x_3^3 y_1 y_2^2 (2 T^3 c_{1,2} c_{1,5} - 2 T^4 c_{1,2} c_{1,5} + T^2 c_{1,5}^2 - T^4 c_{1,5}^2 + 6 T^2 c_{2,4} - 6 T^3 c_{2,4} + 2 T^2 c_{2,8} - \\
& 2 T^3 c_{2,8} + 2 T^3 c_{2,9} - 6 T^4 c_{2,9} + 6 T^5 c_{2,9} - 2 T^6 c_{2,9} + 2 T^2 c_{2,10} - 6 T^3 c_{2,10} + 6 T^4 c_{2,10} - \\
& 2 T^5 c_{2,10} + 2 T c_{2,11} - 6 T^2 c_{2,11} + 6 T^3 c_{2,11} - 2 T^4 c_{2,11} - 2 T c_{2,12} + 4 T^2 c_{2,12} - 2 T^3 c_{2,12}) + \\
& \frac{1}{2} x_3^3 y_1^2 y_2 (-2 T^2 c_{1,2}^2 + 4 T^3 c_{1,2}^2 - 2 T^4 c_{1,2}^2 + T c_{1,2} c_{1,5} - 5 T^2 c_{1,2} c_{1,5} + 5 T^3 c_{1,2} c_{1,5} - \\
& T^4 c_{1,2} c_{1,5} + T c_{1,5}^2 - 2 T^2 c_{1,5}^2 - T^3 c_{1,5}^2 + 2 T^4 c_{1,5}^2 + 6 T c_{2,4} - 12 T^2 c_{2,4} + 6 T^3 c_{2,4} + 2 T^3 c_{2,5} - \\
& 6 T^4 c_{2,5} + 6 T^5 c_{2,5} - 2 T^6 c_{2,5} + 2 T^2 c_{2,6} - 6 T^3 c_{2,6} + 6 T^4 c_{2,6} - 2 T^5 c_{2,6} + 2 T c_{2,7} - \\
& 6 T^2 c_{2,7} + 6 T^3 c_{2,7} - 2 T^4 c_{2,7} - 2 T^2 c_{2,8} + 2 T^3 c_{2,8} + 2 T c_{2,12} - 4 T^2 c_{2,12} + 2 T^3 c_{2,12}) + \\
& x_2^3 y_1 y_3^2 (2 T^3 c_{2,9} - 3 T^4 c_{2,9} + T^5 c_{2,9} + 3 T^2 c_{2,13} - 3 T^3 c_{2,13}) +
\end{aligned}$$

$$\begin{aligned}
& x_1^3 y_2^2 y_3 \left(-3 T c_{2,13} + 6 T^2 c_{2,13} - 3 T^3 c_{2,13} \right) + x_1^3 y_3^3 \left(c_{2,13} - T^3 c_{2,13} \right) + \\
& x_2^3 y_1^3 \left(c_{2,5} - 3 T c_{2,5} + 3 T^2 c_{2,5} - T^3 c_{2,5} + c_{2,9} - 3 T c_{2,9} + 3 T^2 c_{2,9} - T^3 c_{2,9} + c_{2,13} - \right. \\
& \quad \left. 3 T c_{2,13} + 3 T^2 c_{2,13} - T^3 c_{2,13} \right) + x_1^3 y_2^3 \left(-c_{2,13} + 3 T c_{2,13} - 3 T^2 c_{2,13} + T^3 c_{2,13} \right) + \\
& x_2^3 y_1^2 y_3 \left(T^2 c_{2,5} - 2 T^3 c_{2,5} + T^4 c_{2,5} + 2 T c_{2,9} - 4 T^2 c_{2,9} + 2 T^3 c_{2,9} + 3 T c_{2,13} - 6 T^2 c_{2,13} + 3 T^3 c_{2,13} \right) + \\
& x_1^3 y_2 y_3^2 \left(-3 T^2 c_{2,13} + 3 T^3 c_{2,13} \right) + x_1^2 x_2 y_2 y_3^2 \left(-9 T^2 c_{2,13} + 18 T^3 c_{2,13} - 9 T^4 c_{2,13} \right) + \\
& x_1^2 x_2 y_3^3 \left(-3 c_{2,13} + 12 T c_{2,13} - 18 T^2 c_{2,13} + 12 T^3 c_{2,13} - 3 T^4 c_{2,13} \right) + \\
& x_1^2 x_2 y_3^3 \left(-3 T^3 c_{2,13} + 3 T^4 c_{2,13} \right) + x_1^2 x_2 y_2^2 y_3 \left(-9 T c_{2,13} + 27 T^2 c_{2,13} - 27 T^3 c_{2,13} + 9 T^4 c_{2,13} \right) + \\
& x_1 x_2^2 y_2^2 y_3 \left(-9 T c_{2,13} + 36 T^2 c_{2,13} - 54 T^3 c_{2,13} + 36 T^4 c_{2,13} - 9 T^5 c_{2,13} \right) + \\
& x_1 x_2^2 y_3^3 \left(-3 T^3 c_{2,13} + 6 T^4 c_{2,13} - 3 T^5 c_{2,13} \right) + \\
& x_1 x_2^2 y_2^3 \left(-3 c_{2,13} + 15 T c_{2,13} - 30 T^2 c_{2,13} + 30 T^3 c_{2,13} - 15 T^4 c_{2,13} + 3 T^5 c_{2,13} \right) + \\
& x_1 x_2^2 y_2 y_3^2 \left(-9 T^2 c_{2,13} + 27 T^3 c_{2,13} - 27 T^4 c_{2,13} + 9 T^5 c_{2,13} \right) + \\
& x_2^3 y_2 y_3^2 \left(-3 T^2 c_{2,13} + 12 T^3 c_{2,13} - 18 T^4 c_{2,13} + 12 T^5 c_{2,13} - 3 T^6 c_{2,13} \right) + \\
& x_2^3 y_2^3 \left(-c_{2,13} + 6 T c_{2,13} - 15 T^2 c_{2,13} + 20 T^3 c_{2,13} - 15 T^4 c_{2,13} + 6 T^5 c_{2,13} - T^6 c_{2,13} \right) + \\
& x_2^3 y_3^3 \left(-T^3 c_{2,13} + 3 T^4 c_{2,13} - 3 T^5 c_{2,13} + T^6 c_{2,13} \right) + \\
& x_2^3 y_2^2 y_3 \left(-3 T c_{2,13} + 15 T^2 c_{2,13} - 30 T^3 c_{2,13} + 30 T^4 c_{2,13} - 15 T^5 c_{2,13} + 3 T^6 c_{2,13} \right) + \\
& x_2^2 x_3 y_1 y_3^2 \left(T^3 c_{2,10} - T^4 c_{2,10} + 3 T^2 c_{2,14} - 3 T^3 c_{2,14} \right) + \\
& x_1^2 x_3 y_2^2 y_3 \left(-3 T c_{2,14} + 6 T^2 c_{2,14} - 3 T^3 c_{2,14} \right) + x_1^2 x_3 y_3^3 \left(T c_{2,14} - T^3 c_{2,14} \right) + \\
& x_2^2 x_3 y_1^3 \left(-T c_{1,2} c_{1,5} + T^2 c_{1,2} c_{1,5} + c_{1,5}^2 - 2 T c_{1,5}^2 + T^2 c_{1,5}^2 - T c_{2,2} + 2 T^2 c_{2,2} - \right. \\
& \quad \left. T^3 c_{2,2} + T c_{2,3} - T^2 c_{2,3} + 3 c_{2,4} - 3 T c_{2,4} + c_{2,6} - 3 T c_{2,6} + 3 T^2 c_{2,6} - T^3 c_{2,6} + \right. \\
& \quad \left. c_{2,10} - 3 T c_{2,10} + 3 T^2 c_{2,10} - T^3 c_{2,10} + c_{2,14} - 3 T c_{2,14} + 3 T^2 c_{2,14} - T^3 c_{2,14} \right) + \\
& x_1^2 x_3 y_2^3 \left(3 T c_{2,13} - 3 T^2 c_{2,13} + 2 T c_{2,14} - 3 T^2 c_{2,14} + T^3 c_{2,14} \right) + \\
& x_2^2 x_3 y_1^2 y_3 \left(2 T c_{2,10} - 4 T^2 c_{2,10} + 2 T^3 c_{2,10} + 3 T c_{2,14} - 6 T^2 c_{2,14} + 3 T^3 c_{2,14} \right) + \\
& x_1^2 x_3 y_2 y_3^2 \left(-3 T^2 c_{2,14} + 3 T^3 c_{2,14} \right) + x_1 x_2 x_3 y_2 y_3^2 \left(-6 T^2 c_{2,14} + 12 T^3 c_{2,14} - 6 T^4 c_{2,14} \right) + \\
& x_1 x_2 x_3 y_3^3 \left(-2 T^3 c_{2,14} + 2 T^4 c_{2,14} \right) + x_1 x_2 x_3 y_2^2 y_3 \left(-6 T c_{2,14} + 18 T^2 c_{2,14} - 18 T^3 c_{2,14} + 6 T^4 c_{2,14} \right) + \\
& x_2^2 x_3 y_2^2 y_3 \left(-3 T c_{2,14} + 12 T^2 c_{2,14} - 18 T^3 c_{2,14} + 12 T^4 c_{2,14} - 3 T^5 c_{2,14} \right) + \\
& x_2^2 x_3 y_3^3 \left(-T^3 c_{2,14} + 2 T^4 c_{2,14} - T^5 c_{2,14} \right) + x_2^2 x_3 y_2 y_3^2 \left(-3 T^2 c_{2,14} + 9 T^3 c_{2,14} - 9 T^4 c_{2,14} + 3 T^5 c_{2,14} \right) + \\
& x_1 x_2 x_3 y_2^3 \left(-2 c_{2,14} + 10 T c_{2,14} - 14 T^2 c_{2,14} + 8 T^3 c_{2,14} - 2 T^4 c_{2,14} + 2 c_{2,15} - 2 T c_{2,15} \right) + \\
& x_2 x_3^2 y_1 y_3^2 \left(3 T^2 c_{2,15} - 3 T^3 c_{2,15} \right) + x_1 x_3^2 y_2^2 y_3 \left(-3 T c_{2,15} + 6 T^2 c_{2,15} - 3 T^3 c_{2,15} \right) + \\
& \frac{1}{2} x_2 x_3^2 y_1^3 \left(-2 T c_{1,2}^2 + 4 T^2 c_{1,2}^2 - 2 T^3 c_{1,2}^2 + c_{1,2} c_{1,5} - 5 T c_{1,2} c_{1,5} + 9 T^2 c_{1,2} c_{1,5} - 5 T^3 c_{1,2} c_{1,5} + \right. \\
& \quad \left. c_{1,5}^2 - 3 T c_{1,5}^2 + 3 T^2 c_{1,5}^2 - T^3 c_{1,5}^2 + 2 T^2 c_{2,2} - 4 T^3 c_{2,2} + 2 T^4 c_{2,2} - 2 T^2 c_{2,3} + 2 T^3 c_{2,3} + 6 c_{2,4} - \right. \\
& \quad \left. 12 T c_{2,4} + 6 T^2 c_{2,4} + 2 c_{2,7} - 6 T c_{2,7} + 6 T^2 c_{2,7} - 2 T^3 c_{2,7} + 2 c_{2,11} - 6 T c_{2,11} + 6 T^2 c_{2,11} - \right. \\
& \quad \left. 2 T^3 c_{2,11} + 2 c_{2,15} - 6 T c_{2,15} + 6 T^2 c_{2,15} - 2 T^3 c_{2,15} \right) + x_1 x_3^2 y_3^3 \left(T^2 c_{2,15} - T^3 c_{2,15} \right) + x_1 x_3^2 y_2^3 \\
& \quad \left(3 T^2 c_{2,13} - 6 T^3 c_{2,13} + 3 T^4 c_{2,13} + 2 T c_{2,14} - 4 T^2 c_{2,14} + 2 T^3 c_{2,14} + T c_{2,15} - 2 T^2 c_{2,15} + T^3 c_{2,15} \right) + \\
& x_1 x_3^2 y_2 y_3^2 \left(-3 T^2 c_{2,15} + 3 T^3 c_{2,15} \right) + \frac{1}{2} x_2 x_3^2 y_1^2 y_3 \left(2 T^3 c_{1,2}^2 - T^2 c_{1,2} c_{1,5} + 3 T^3 c_{1,2} c_{1,5} + T c_{1,5}^2 - \right. \\
& \quad \left. T^3 c_{1,5}^2 - 2 T^2 c_{2,7} + 2 T^3 c_{2,7} + 4 T c_{2,11} - 8 T^2 c_{2,11} + 4 T^3 c_{2,11} + 6 T c_{2,15} - 12 T^2 c_{2,15} + 6 T^3 c_{2,15} \right) + \\
& x_2 x_3^2 y_2 y_3^2 \left(-3 T^2 c_{2,15} + 6 T^3 c_{2,15} - 3 T^4 c_{2,15} \right) + x_3^3 y_3^3 \left(T^3 c_{2,13} - 3 T^4 c_{2,13} + 3 T^5 c_{2,13} - \right. \\
& \quad \left. T^6 c_{2,13} + T^2 c_{2,14} - 3 T^3 c_{2,14} + 3 T^4 c_{2,14} - T^5 c_{2,14} + T c_{2,15} - 3 T^2 c_{2,15} + 3 T^3 c_{2,15} - T^4 c_{2,15} \right) + \\
& x_2 x_3^2 y_3^3 \left(-T^3 c_{2,15} + T^4 c_{2,15} \right) + x_2 x_3^2 y_2^2 y_3 \left(-3 T c_{2,15} + 9 T^2 c_{2,15} - 9 T^3 c_{2,15} + 3 T^4 c_{2,15} \right) +
\end{aligned}$$

$$\begin{aligned}
 & x_2^2 x_3 y_2^3 \left(-c_{2,14} + 5 T c_{2,14} - 10 T^2 c_{2,14} + 10 T^3 c_{2,14} - 5 T^4 c_{2,14} + T^5 c_{2,14} + \right. \\
 & \quad \left. T c_{2,15} - T^2 c_{2,15} + 3 c_{2,16} - 3 T c_{2,16} \right) + x_2 x_3^2 y_2^3 \left(T^2 c_{2,14} - 2 T^3 c_{2,14} + T^4 c_{2,14} - \right. \\
 & \quad \left. c_{2,15} + 6 T c_{2,15} - 10 T^2 c_{2,15} + 6 T^3 c_{2,15} - T^4 c_{2,15} + 3 c_{2,16} - 6 T c_{2,16} + 3 T^2 c_{2,16} \right) + \\
 & x_3^3 y_1 y_2^3 \left(3 T^2 c_{2,16} - 3 T^3 c_{2,16} \right) + x_3^3 y_2^2 y_3 \left(-3 T c_{2,16} + 6 T^2 c_{2,16} - 3 T^3 c_{2,16} \right) + \\
 & \frac{1}{2} x_3^3 y_1^3 \left(2 T c_{1,2}^2 - 4 T^2 c_{1,2}^2 + 2 T^3 c_{1,2}^2 - c_{1,2} c_{1,5} + 5 T c_{1,2} c_{1,5} - 7 T^2 c_{1,2} c_{1,5} + 3 T^3 c_{1,2} c_{1,5} - \right. \\
 & \quad c_{1,5}^2 + 3 T c_{1,5}^2 - 5 T^2 c_{1,5}^2 + 5 T^3 c_{1,5}^2 - 2 T^4 c_{1,5}^2 + 2 T^3 c_{2,1} - 6 T^4 c_{2,1} + 6 T^5 c_{2,1} - 2 T^6 c_{2,1} + \\
 & \quad 2 T^2 c_{2,2} - 6 T^3 c_{2,2} + 6 T^4 c_{2,2} - 2 T^5 c_{2,2} + 2 T c_{2,3} - 6 T^2 c_{2,3} + 6 T^3 c_{2,3} - 2 T^4 c_{2,3} + \\
 & \quad 2 c_{2,4} - 12 T c_{2,4} + 12 T^2 c_{2,4} - 2 T^3 c_{2,4} + 2 c_{2,8} - 6 T c_{2,8} + 6 T^2 c_{2,8} - 2 T^3 c_{2,8} + \\
 & \quad 2 c_{2,12} - 6 T c_{2,12} + 6 T^2 c_{2,12} - 2 T^3 c_{2,12} + 2 c_{2,16} - 6 T c_{2,16} + 6 T^2 c_{2,16} - 2 T^3 c_{2,16} \left. \right) + \\
 & x_3^3 y_1^2 y_3 \left(-2 T^3 c_{1,2} c_{1,5} + 2 T^4 c_{1,2} c_{1,5} + T^2 c_{1,5}^2 - 4 T^3 c_{1,5}^2 + 3 T^4 c_{1,5}^2 - 2 T^2 c_{2,8} + 2 T^3 c_{2,8} + \right. \\
 & \quad \left. 2 T c_{2,12} - 4 T^2 c_{2,12} + 2 T^3 c_{2,12} + 3 T c_{2,16} - 6 T^2 c_{2,16} + 3 T^3 c_{2,16} \right) + x_3^3 y_2 y_3^2 \left(-3 T^2 c_{2,16} + 3 T^3 c_{2,16} \right) \left. \right]
 \end{aligned}$$

In[]:= **\$k = 2**

Out[]:= 2

In[]:= **m_{2,5→2} // m_{3,6→3}**

Out[]:= $\mathbb{E}_{\{2,3,5,6\} \rightarrow \{2,3\}} [\mathbf{1}, y_2 (\eta_2 + \eta_5) + y_3 (\eta_3 + \eta_6) - \eta_5 \xi_2 - \eta_6 \xi_3 + x_2 (\xi_2 + \xi_5) + x_3 (\xi_3 + \xi_6), \in \text{Series}[\mathbf{0}, \mathbf{0}, \mathbf{0}]]$

In[]:= **m_{1,4→1} // (m_{2,5→2} // m_{3,6→3})**

Out[]:= $\mathbb{E}_{\{1,2,3,4,5,6\} \rightarrow \{1,2,3\}} [\mathbf{1}, y_1 (\eta_1 + \eta_4) + y_2 (\eta_2 + \eta_5) + y_3 (\eta_3 + \eta_6) - \eta_4 \xi_1 - \eta_5 \xi_2 - \eta_6 \xi_3 + x_1 (\xi_1 + \xi_4) + x_2 (\xi_2 + \xi_5) + x_3 (\xi_3 + \xi_6), \in \text{Series}[\mathbf{0}, \mathbf{0}, \mathbf{0}]]$

In[]:= **R_{1,2} R_{4,3} R_{5,6} // m_{1,4→1} // (m_{2,5→2} // m_{3,6→3})**

Out[]:= $\mathbb{E}_{\{\} \rightarrow \{1,2,3\}} \left[\mathbf{1}, (-1 + T) x_2 y_1 + (-1 + T) x_3 y_1 + (1 - T) x_2 y_2 + (-T + T^2) x_3 y_2 + (1 - T^2) x_3 y_3, \right.$
 $\in \text{Series} \left[\mathbf{0}, x_1 x_2 y_1 y_2 c_{1,5} - T x_2^2 y_1 y_2 c_{1,5} + T x_1 x_3 y_1 y_3 c_{1,5} - T^2 x_3^2 y_1 y_3 c_{1,5} + \right.$
 $T^2 x_2 x_3 y_2 y_3 c_{1,5} - T^3 x_3^2 y_2 y_3 c_{1,5} + \frac{x_1 x_2 y_1^2 (c_{1,5} - T c_{1,5})}{2 T} + \frac{x_1 x_3 y_1^2 (c_{1,5} - T c_{1,5})}{2 T} +$
 $x_1 x_3 y_1 y_2 (c_{1,5} - T c_{1,5}) + \frac{1}{2} x_2^2 y_1^2 (-c_{1,5} + T c_{1,5}) + \frac{1}{2} x_3^2 y_1^2 (-c_{1,5} + T c_{1,5}) +$
 $\frac{1}{2} x_2 x_3 y_2^2 (T c_{1,5} - T^2 c_{1,5}) + x_2 x_3 y_1 y_3 (T c_{1,5} - T^2 c_{1,5}) + \frac{x_2 x_3 y_1^2 (c_{1,5} - 2 T c_{1,5} + T^2 c_{1,5})}{2 T} +$
 $x_2 x_3 y_1 y_2 (c_{1,5} - 2 T c_{1,5} + T^2 c_{1,5}) + x_3^2 y_1 y_2 (-T c_{1,5} + T^2 c_{1,5}) + \frac{1}{2} x_3^2 y_2^2 (-T^2 c_{1,5} + T^3 c_{1,5}),$
 $-3 T x_1 x_2 x_3 y_1 y_2 y_3 c_{1,5}^2 + x_1 x_2 x_3 y_1^2 y_3 (-2 c_{1,5}^2 + 2 T c_{1,5}^2) + x_1 x_3^2 y_1 y_2 y_3 (-T c_{1,5}^2 + 3 T^2 c_{1,5}^2) +$
 $2 x_1^3 y_1^3 c_{2,1} + x_1^2 x_2 y_1^3 c_{2,2} + x_1^2 x_3 y_1^3 (3 T c_{2,1} - 3 T^2 c_{2,1} + c_{2,2}) + x_1 x_2^2 y_1^3 c_{2,3} + x_1 x_3^2 y_1^3 (c_{1,5}^2 - 2 T c_{1,5}^2 +$
 $T^2 c_{1,5}^2 + 3 T^2 c_{2,1} - 6 T^3 c_{2,1} + 3 T^4 c_{2,1} + 2 T c_{2,2} - 4 T^2 c_{2,2} + 2 T^3 c_{2,2} + c_{2,3} - 2 T c_{2,3} + 2 T^2 c_{2,3}) +$
 $\frac{x_1 x_2 x_3 y_1^3 (-c_{1,5}^2 + 3 T^2 c_{1,5}^2 - 2 T^3 c_{1,5}^2 + 4 T^3 c_{2,2} - 4 T^4 c_{2,2} + 4 T^2 c_{2,3} - 4 T^3 c_{2,3})}{2 T^2} +$
 $x_1^3 y_1^2 y_2 c_{2,5} + x_1^3 y_1^2 y_3 c_{2,5} + T^3 x_2^3 y_2^2 y_3 c_{2,5} + x_1^2 x_2 y_1^2 y_2 c_{2,6} + T x_1^2 x_3 y_1^2 y_3 c_{2,6} + T^3 x_2^2 x_3 y_2^2 y_3 c_{2,6} +$
 $x_1^2 x_3 y_1^2 y_2 (3 T c_{2,5} - 3 T^2 c_{2,5} + c_{2,6} - T c_{2,6}) + x_1 x_2^2 y_1^2 y_2 c_{2,7} + T^3 x_2 x_3^2 y_2^2 y_3 c_{2,7} +$

$$\begin{aligned}
& \frac{x_1 x_2 x_3 y_1^2 y_2 (-3 c_{1,5}^2 + T c_{1,5}^2 + 2 T^2 c_{1,5}^2 + 4 T^2 c_{2,6} - 4 T^3 c_{2,6} + 4 T c_{2,7} - 4 T^2 c_{2,7})}{2 T} + \\
& \frac{1}{2} x_1 x_3^2 y_1^2 y_3 (-c_{1,5}^2 + 5 T c_{1,5}^2 - 4 T^2 c_{1,5}^2 + 2 T^2 c_{2,7}) + \\
& \frac{1}{2} x_1 x_3^2 y_1^2 y_2 (c_{1,5}^2 + T c_{1,5}^2 - 2 T^2 c_{1,5}^2 + 6 T^2 c_{2,5} - 12 T^3 c_{2,5} + 6 T^4 c_{2,5} + 4 T c_{2,6} - \\
& \quad 8 T^2 c_{2,6} + 4 T^3 c_{2,6} + 2 c_{2,7} - 4 T c_{2,7} + 2 T^2 c_{2,7}) + T^3 x_3^3 y_2^2 y_3 c_{2,8} + x_1^3 y_1 y_2^2 c_{2,9} + \\
& x_1^3 y_1 y_3^2 c_{2,9} + T^3 x_2^3 y_2 y_3^2 c_{2,9} + x_2^3 y_1 y_2 y_3 (2 T^2 c_{2,5} - 2 T^3 c_{2,5} + 2 T^2 c_{2,9} - 2 T^3 c_{2,9}) + x_2^3 y_1^2 \\
& \quad y_2 (3 T c_{2,1} - 6 T^2 c_{2,1} + 3 T^3 c_{2,1} + 2 T c_{2,5} - 4 T^2 c_{2,5} + 2 T^3 c_{2,5} + c_{2,8} + T c_{2,9} - 2 T^2 c_{2,9} + T^3 c_{2,9}) + \\
& x_1^2 x_2 y_1 y_2^2 c_{2,10} + T x_1^2 x_3 y_1 y_3^2 c_{2,10} + T^3 x_2^2 x_3 y_2 y_3^2 c_{2,10} + \\
& x_1^2 x_3 y_1 y_2^2 (3 T c_{2,9} - 3 T^2 c_{2,9} + c_{2,10} - T c_{2,10}) + \\
& x_2^2 x_3 y_1 y_2 y_3 (2 T^2 c_{1,5}^2 + 2 T^2 c_{2,6} - 2 T^3 c_{2,6} + 2 T^2 c_{2,10} - 2 T^3 c_{2,10}) + \\
& \frac{1}{2} x_2^2 x_3 y_1^2 y_2 (3 c_{1,5}^2 - 2 T c_{1,5}^2 - T^2 c_{1,5}^2 + 6 T c_{2,2} - 12 T^2 c_{2,2} + 6 T^3 c_{2,2} + 4 T c_{2,6} - 8 T^2 c_{2,6} + \\
& \quad 4 T^3 c_{2,6} + 2 T c_{2,7} - 2 T^2 c_{2,7} + 6 c_{2,8} - 6 T c_{2,8} + 2 T c_{2,10} - 4 T^2 c_{2,10} + 2 T^3 c_{2,10}) + \\
& x_1 x_2^2 y_1 y_2^2 c_{2,11} + T^2 x_1 x_3^2 y_1 y_3^2 c_{2,11} + T^3 x_2 x_3^2 y_2 y_3^2 c_{2,11} + \\
& x_1 x_2 x_3 y_1 y_2^2 (-c_{1,5}^2 + T c_{1,5}^2 + 2 T c_{2,10} - 2 T^2 c_{2,10} + 2 c_{2,11} - 2 T c_{2,11}) + x_1 x_3^2 y_1 y_2^2 (T c_{1,5}^2 - T^2 c_{1,5}^2 + \\
& \quad 3 T^2 c_{2,9} - 6 T^3 c_{2,9} + 3 T^4 c_{2,9} + 2 T c_{2,10} - 4 T^2 c_{2,10} + 2 T^3 c_{2,10} + c_{2,11} - 2 T c_{2,11} + T^2 c_{2,11}) + \\
& x_2 x_3^2 y_1 y_2 y_3 (T^2 c_{1,5}^2 + 2 T^2 c_{2,7} - 2 T^3 c_{2,7} + 2 T^2 c_{2,11} - 2 T^3 c_{2,11}) + \frac{1}{2} x_2 x_3^2 y_1^2 y_2 \\
& \quad (-T c_{1,5}^2 + 2 T^2 c_{1,5}^2 - T^3 c_{1,5}^2 + 6 T c_{2,3} - 12 T^2 c_{2,3} + 6 T^3 c_{2,3} + 2 T^2 c_{2,6} - 4 T^3 c_{2,6} + 2 T^4 c_{2,6} + \\
& \quad 8 T c_{2,7} - 16 T^2 c_{2,7} + 8 T^3 c_{2,7} + 6 c_{2,8} - 12 T c_{2,8} + 6 T^2 c_{2,8} + 2 T c_{2,11} - 4 T^2 c_{2,11} + 2 T^3 c_{2,11}) + \\
& T^3 x_3^3 y_2 y_3^2 c_{2,12} + x_2^3 y_1 y_2^2 (3 T^2 c_{2,1} - 3 T^3 c_{2,1} + T^2 c_{2,5} - T^3 c_{2,5} + c_{2,12}) + x_2^2 x_3 y_1 y_2^2 \\
& \quad (T c_{1,5}^2 - T^2 c_{1,5}^2 + 3 T^2 c_{2,2} - 3 T^3 c_{2,2} + T^2 c_{2,6} - T^3 c_{2,6} + T c_{2,11} - T^2 c_{2,11} + 3 c_{2,12} - 3 T c_{2,12}) + \\
& x_2 x_3^2 y_1 y_2^2 (-T^2 c_{1,5}^2 + T^3 c_{1,5}^2 + 3 T^2 c_{2,3} - 3 T^3 c_{2,3} + T^2 c_{2,7} - T^3 c_{2,7} + T^2 c_{2,10} - 2 T^3 c_{2,10} + \\
& \quad T^4 c_{2,10} + 2 T c_{2,11} - 4 T^2 c_{2,11} + 2 T^3 c_{2,11} + 3 c_{2,12} - 6 T c_{2,12} + 3 T^2 c_{2,12}) + \\
& x_3^3 y_1 y_2 y_3 (-2 T^4 c_{1,5}^2 + 2 T^2 c_{2,8} - 2 T^3 c_{2,8} + 2 T^2 c_{2,12} - 2 T^3 c_{2,12}) + x_3^3 y_1 y_2^2 (3 T^2 c_{2,4} - \\
& \quad 3 T^3 c_{2,4} + T^2 c_{2,8} - T^3 c_{2,8} + T^3 c_{2,9} - 3 T^4 c_{2,9} + 3 T^5 c_{2,9} - T^6 c_{2,9} + T^2 c_{2,10} - 3 T^3 c_{2,10} + 3 T^4 c_{2,10} - \\
& \quad T^5 c_{2,10} + T c_{2,11} - 3 T^2 c_{2,11} + 3 T^3 c_{2,11} - T^4 c_{2,11} + c_{2,12} - 3 T c_{2,12} + 3 T^2 c_{2,12} - T^3 c_{2,12}) + \\
& x_3^3 y_1^2 y_2 (-T^3 c_{1,5}^2 + T^4 c_{1,5}^2 + 3 T c_{2,4} - 6 T^2 c_{2,4} + 3 T^3 c_{2,4} + T^3 c_{2,5} - 3 T^4 c_{2,5} + 3 T^5 c_{2,5} - \\
& \quad T^6 c_{2,5} + T^2 c_{2,6} - 3 T^3 c_{2,6} + 3 T^4 c_{2,6} - T^5 c_{2,6} + T c_{2,7} - 3 T^2 c_{2,7} + 3 T^3 c_{2,7} - \\
& \quad T^4 c_{2,7} + c_{2,8} - T c_{2,8} - T^2 c_{2,8} + T^3 c_{2,8} + T c_{2,12} - 2 T^2 c_{2,12} + T^3 c_{2,12}) + \\
& x_1^3 y_2^3 c_{2,13} + x_1^3 y_3^3 c_{2,13} + T^3 x_2^3 y_3^3 c_{2,13} + x_2^3 y_1 y_3^2 (T^2 c_{2,9} - T^3 c_{2,9} + 3 T^2 c_{2,13} - 3 T^3 c_{2,13}) + \\
& x_2^3 y_1^3 (c_{2,1} - 3 T c_{2,1} + 3 T^2 c_{2,1} - T^3 c_{2,1} + c_{2,4} + c_{2,5} - 3 T c_{2,5} + 3 T^2 c_{2,5} - T^3 c_{2,5} + \\
& \quad c_{2,9} - 3 T c_{2,9} + 3 T^2 c_{2,9} - T^3 c_{2,9} + c_{2,13} - 3 T c_{2,13} + 3 T^2 c_{2,13} - T^3 c_{2,13}) + \\
& x_2^3 y_1^2 y_3 (T c_{2,5} - 2 T^2 c_{2,5} + T^3 c_{2,5} + 2 T c_{2,9} - 4 T^2 c_{2,9} + 2 T^3 c_{2,9} + 3 T c_{2,13} - 6 T^2 c_{2,13} + 3 T^3 c_{2,13}) + \\
& x_1^2 x_2 y_2^3 c_{2,14} + T x_1^2 x_3 y_3^3 c_{2,14} + T^3 x_2^2 x_3 y_3^3 c_{2,14} + x_1^2 x_3 y_2^2 (3 T c_{2,13} - 3 T^2 c_{2,13} + c_{2,14} - T c_{2,14}) + \\
& x_2^2 x_3 y_1 y_3^2 (T^2 c_{2,10} - T^3 c_{2,10} + 3 T^2 c_{2,14} - 3 T^3 c_{2,14}) + x_2^2 x_3 y_1^2 y_3 (T c_{1,5}^2 - T^2 c_{1,5}^2 + T c_{2,6} - \\
& \quad 2 T^2 c_{2,6} + T^3 c_{2,6} + 2 T c_{2,10} - 4 T^2 c_{2,10} + 2 T^3 c_{2,10} + 3 T c_{2,14} - 6 T^2 c_{2,14} + 3 T^3 c_{2,14}) + \\
& \frac{1}{2 T} x_2^2 x_3 y_1^3 (c_{1,5}^2 - T c_{1,5}^2 - T^2 c_{1,5}^2 + T^3 c_{1,5}^2 + 2 T c_{2,2} - 6 T^2 c_{2,2} + 6 T^3 c_{2,2} - 2 T^4 c_{2,2} +
\end{aligned}$$

$$\begin{aligned}
 & 2 T^2 c_{2,3} - 2 T^3 c_{2,3} + 6 T c_{2,4} - 6 T^2 c_{2,4} + 2 T c_{2,6} - 6 T^2 c_{2,6} + 6 T^3 c_{2,6} - 2 T^4 c_{2,6} + 2 T c_{2,10} - \\
 & 6 T^2 c_{2,10} + 6 T^3 c_{2,10} - 2 T^4 c_{2,10} + 2 T c_{2,14} - 6 T^2 c_{2,14} + 6 T^3 c_{2,14} - 2 T^4 c_{2,14} + x_1 x_2^2 y_2^3 c_{2,15} + \\
 & T^2 x_1 x_3^2 y_3^3 c_{2,15} + T^3 x_2 x_3^2 y_3^3 c_{2,15} + x_1 x_2 x_3 y_2^3 (2 T c_{2,14} - 2 T^2 c_{2,14} + 2 c_{2,15} - 2 T c_{2,15}) + x_1 \\
 & x_3^2 y_2^3 (3 T^2 c_{2,13} - 6 T^3 c_{2,13} + 3 T^4 c_{2,13} + 2 T c_{2,14} - 4 T^2 c_{2,14} + 2 T^3 c_{2,14} + c_{2,15} - 2 T c_{2,15} + T^2 c_{2,15}) + \\
 & x_2 x_3^2 y_1 y_3^2 (T^2 c_{2,11} - T^3 c_{2,11} + 3 T^2 c_{2,15} - 3 T^3 c_{2,15}) + \\
 & \frac{1}{2} x_2 x_3^2 y_1^3 (T c_{1,5}^2 - 2 T^2 c_{1,5}^2 + T^3 c_{1,5}^2 + 2 T^2 c_{2,2} - 4 T^3 c_{2,2} + 2 T^4 c_{2,2} + 2 c_{2,3} - 2 T c_{2,3} - \\
 & 2 T^2 c_{2,3} + 2 T^3 c_{2,3} + 6 c_{2,4} - 12 T c_{2,4} + 6 T^2 c_{2,4} + 2 c_{2,7} - 6 T c_{2,7} + 6 T^2 c_{2,7} - 2 T^3 c_{2,7} + \\
 & 2 c_{2,11} - 6 T c_{2,11} + 6 T^2 c_{2,11} - 2 T^3 c_{2,11} + 2 c_{2,15} - 6 T c_{2,15} + 6 T^2 c_{2,15} - 2 T^3 c_{2,15}) + \\
 & \frac{1}{2} x_2 x_3^2 y_1^2 y_3 (T c_{1,5}^2 + T^2 c_{1,5}^2 - 2 T^3 c_{1,5}^2 + 2 T c_{2,7} - 4 T^2 c_{2,7} + 2 T^3 c_{2,7} + 4 T c_{2,11} - \\
 & 8 T^2 c_{2,11} + 4 T^3 c_{2,11} + 6 T c_{2,15} - 12 T^2 c_{2,15} + 6 T^3 c_{2,15}) + 2 T^3 x_3^3 y_3^3 c_{2,16} + \\
 & x_2^3 y_2^3 (T^3 c_{2,1} + c_{2,16}) + x_2^2 x_3 y_2^3 (T^3 c_{2,2} + T c_{2,15} - T^2 c_{2,15} + 3 c_{2,16} - 3 T c_{2,16}) + \\
 & x_2 x_3^2 y_2^3 (T^3 c_{2,3} + T^2 c_{2,14} - 2 T^3 c_{2,14} + T^4 c_{2,14} + 2 T c_{2,15} - 4 T^2 c_{2,15} + 2 T^3 c_{2,15} + \\
 & 3 c_{2,16} - 6 T c_{2,16} + 3 T^2 c_{2,16}) + x_3^3 y_1 y_3^2 (T^2 c_{2,12} + 3 T^2 c_{2,16} - 3 T^3 c_{2,16}) + \\
 & x_3^3 y_1^3 (-T^2 c_{1,5}^2 + 2 T^3 c_{1,5}^2 - T^4 c_{1,5}^2 + T^3 c_{2,1} - 3 T^4 c_{2,1} + 3 T^5 c_{2,1} - T^6 c_{2,1} + T^2 c_{2,2} - 3 T^3 c_{2,2} + 3 T^4 c_{2,2} - \\
 & T^5 c_{2,2} + T c_{2,3} - 3 T^2 c_{2,3} + 3 T^3 c_{2,3} - T^4 c_{2,3} + 2 c_{2,4} - 6 T c_{2,4} + 6 T^2 c_{2,4} - T^3 c_{2,4} + c_{2,8} - 3 T c_{2,8} + \\
 & 3 T^2 c_{2,8} - T^3 c_{2,8} + c_{2,12} - 3 T c_{2,12} + 3 T^2 c_{2,12} - T^3 c_{2,12} + c_{2,16} - 3 T c_{2,16} + 3 T^2 c_{2,16} - T^3 c_{2,16}) + \\
 & x_3^3 y_2^3 (T^3 c_{2,4} + T^3 c_{2,13} - 3 T^4 c_{2,13} + 3 T^5 c_{2,13} - T^6 c_{2,13} + T^2 c_{2,14} - 3 T^3 c_{2,14} + 3 T^4 c_{2,14} - \\
 & T^5 c_{2,14} + T c_{2,15} - 3 T^2 c_{2,15} + 3 T^3 c_{2,15} - T^4 c_{2,15} + c_{2,16} - 3 T c_{2,16} + 3 T^2 c_{2,16} - T^3 c_{2,16}) + \\
 & x_3^3 y_1^2 y_3 (-2 T^3 c_{1,5}^2 + 2 T^4 c_{1,5}^2 + T c_{2,8} - 2 T^2 c_{2,8} + 2 T^3 c_{2,8} + 2 T c_{2,12} - \\
 & 4 T^2 c_{2,12} + 2 T^3 c_{2,12} + 3 T c_{2,16} - 6 T^2 c_{2,16} + 3 T^3 c_{2,16})]]]
 \end{aligned}$$

In[]:= (R_{1,2} R_{4,3} R_{5,6} // m_{1,4→1} // m_{2,5→2} // m_{3,6→3}) ≡ (R_{1,2} R_{4,3} R_{5,6} // m_{1,4→1} // (m_{2,5→2} // m_{3,6→3}))

Out[]:= True