

In[ ]:= \$k = 2;

$$\begin{aligned} \text{CF}@ \{ & (R_{1,2} R_{4,3} R_{5,6} // m_{1,4 \rightarrow 1} // m_{2,5 \rightarrow 2} // m_{3,6 \rightarrow 3}) \llbracket 3, -1 \rrbracket - \\ & (R_{2,3} R_{4,5} R_{1,6} // m_{1,4 \rightarrow 1} // m_{2,5 \rightarrow 2} // m_{3,6 \rightarrow 3}) \llbracket 3, -1 \rrbracket, \\ & (R_{1,2} \bar{R}_{3,4} // m_{1,3 \rightarrow 1} // m_{2,4 \rightarrow 2}) \llbracket 3, -1 \rrbracket, \\ & (CC_1 \bar{CC}_2 // m_{1,2 \rightarrow 1}) \llbracket 3, -1 \rrbracket, \\ & (CC_3 R_{1,2} // m_{2,3 \rightarrow 2} // m_{2,1 \rightarrow 1}) \llbracket 3, -1 \rrbracket - (\bar{CC}_3 R_{1,2} // m_{1,3 \rightarrow 1} // m_{1,2 \rightarrow 1}) \llbracket 3, -1 \rrbracket \} \end{aligned}$$

$$\begin{aligned} \text{Out[ ]} = & \left\{ x_2 x_3 y_1 y_2 \left( -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 \right) + \right. \\ & \frac{1}{2} x_3^2 y_1^2 \left( -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 \right) + \\ & x_1^2 x_2 y_1^3 \left( -3 c_{2,1} + 3 T c_{2,1} \right) + x_1^2 x_3 y_1^3 \left( 3 T c_{2,1} - 3 T^2 c_{2,1} \right) + x_1 x_2^2 y_1^3 \left( -3 c_{2,1} + 6 T c_{2,1} - 3 T^2 c_{2,1} \right) + \\ & x_1 x_2 x_3 y_1^3 \left( -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} \right) + \\ & x_1 x_2^2 y_1^3 \left( 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} + \right. \\ & \quad \left. 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} \right) + \\ & x_1^3 y_1^2 y_3 \left( c_{2,5} - T c_{2,5} \right) + x_1^3 y_1^2 y_2 \left( -c_{2,5} + T c_{2,5} \right) + x_1^2 x_3 y_1^2 y_2 \left( 3 T c_{2,5} - 3 T^2 c_{2,5} \right) + \\ & x_1^2 x_2 y_1^2 y_2 \left( -3 c_{2,5} + 6 T c_{2,5} - 3 T^2 c_{2,5} \right) + x_1^2 x_2 y_1^2 y_3 \left( -3 T c_{2,5} + 3 T^2 c_{2,5} \right) + \\ & x_1 x_2^2 y_1^2 y_3 \left( -3 T c_{2,5} + 6 T^2 c_{2,5} - 3 T^3 c_{2,5} \right) + x_1 x_2^2 y_1^2 y_2 \left( -3 c_{2,5} + 9 T c_{2,5} - 9 T^2 c_{2,5} + 3 T^3 c_{2,5} \right) + \\ & x_1 x_2 x_3 y_1^2 y_3 \left( -c_{1,5}^2 + T c_{1,5}^2 - 2 T c_{2,6} + 2 T^2 c_{2,6} \right) + x_1 x_2 x_3 y_1^2 y_2 \\ & \quad \left( -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} \right) + \\ & \frac{1}{2} x_1 x_3^2 y_1^2 y_3 \left( 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} \right) + \\ & \frac{1}{2} x_1 x_3^2 y_1^2 y_2 \left( 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} - \right. \\ & \quad \left. 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} \right) + \\ & x_1^3 y_1 y_2^2 \left( c_{2,9} - T^2 c_{2,9} \right) + x_1^3 y_1 y_2^2 \left( -c_{2,9} + 2 T c_{2,9} - T^2 c_{2,9} \right) + x_1^3 y_1 y_2 y_3 \left( -2 T c_{2,9} + 2 T^2 c_{2,9} \right) + \\ & x_1^2 x_2 y_1 y_2 y_3 \left( -6 T c_{2,9} + 12 T^2 c_{2,9} - 6 T^3 c_{2,9} \right) + \\ & x_2^3 y_1^2 y_2 \left( 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} + \right. \\ & \quad \left. T c_{2,9} - 2 T^2 c_{2,9} + T^3 c_{2,9} \right) + x_1^2 x_2 y_1 y_2^2 \left( -3 c_{2,9} + 9 T c_{2,9} - 9 T^2 c_{2,9} + 3 T^3 c_{2,9} \right) + \\ & x_1^2 x_2 y_1 y_3^2 \left( -3 T^2 c_{2,9} + 3 T^3 c_{2,9} \right) + x_1 x_2^2 y_1 y_3^2 \left( -3 T^2 c_{2,9} + 6 T^3 c_{2,9} - 3 T^4 c_{2,9} \right) + \\ & x_1 x_2^2 y_1 y_2^2 \left( -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} \right) + \\ & x_1 x_2^2 y_1 y_2 y_3 \left( -6 T c_{2,9} + 18 T^2 c_{2,9} - 18 T^3 c_{2,9} + 6 T^4 c_{2,9} \right) + \\ & x_2^3 y_1 y_2 y_3 \left( 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} \right) + x_2^3 y_1 y_2^2 \\ & \quad \left( 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} \right) + \\ & x_1^2 x_3 y_1 y_3^2 \left( T c_{2,10} - T^2 c_{2,10} \right) + x_1^2 x_3 y_1 y_2^2 \left( 3 T c_{2,9} - 3 T^2 c_{2,9} + T c_{2,10} - T^2 c_{2,10} \right) + \\ & x_1^2 x_3 y_1 y_2 y_3 \left( -2 T c_{2,10} + 2 T^2 c_{2,10} \right) + x_1 x_2 x_3 y_1 y_2 y_3 \left( -4 T c_{2,10} + 8 T^2 c_{2,10} - 4 T^3 c_{2,10} \right) + \\ & \frac{1}{2} x_2^2 x_3 y_1^2 y_2 \left( 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 + \right. \\ & \quad \left. 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} + \right. \\ & \quad \left. 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} \right) + \\ & x_1 x_3^2 y_1 y_2^2 \left( 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} \right) + \\ & x_1 x_2 x_3 y_1 y_3^2 \left( -2 T^2 c_{2,10} + 2 T^3 c_{2,10} \right) + \end{aligned}$$

$$\begin{aligned}
& x_2^2 x_3 y_1 y_2 y_3 \left( 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} \right) + \\
& x_1 x_2 x_3 y_1 y_2^2 \left( 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} \right) + \\
& x_1 x_3^2 y_1 y_2 y_3 \left( -T c_{1,5}^2 + T^2 c_{1,5}^2 - 2 T c_{2,11} + 2 T^2 c_{2,11} \right) + x_2 x_3^2 y_1 y_2 y_3 \left( -2 T^3 c_{1,2}^2 + T^2 c_{1,2} c_{1,5} - \right. \\
& \quad \left. 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} \right) + \\
& \frac{1}{2} x_2 x_3^2 y_1^2 y_2 \left( 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} + \right. \\
& \quad 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} + \\
& \quad 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} + \\
& \quad \left. 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} \right) + \\
& \frac{1}{2} x_2^2 x_3 y_1 y_2^2 \left( 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 + \right. \\
& \quad 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} + \\
& \quad \left. 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} \right) + \\
& \frac{1}{2} x_2 x_3^2 y_1 y_2^2 \left( 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 + \right. \\
& \quad 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} + \\
& \quad \left. 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} \right) + \\
& x_3^2 y_1 y_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 + \right. \\
& \quad \left. 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} \right) + \\
& \frac{1}{2} x_3^3 y_1 y_2^2 \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 - T^4 c_{1,5}^2 + 6 T^2 c_{2,4} - 6 T^3 c_{2,4} + 2 T^2 c_{2,8} - \right. \\
& \quad 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} - \\
& \quad \left. 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} \right) + \\
& \frac{1}{2} x_3^3 y_1^2 y_2 \left( -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} - \right. \\
& \quad 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} - \\
& \quad 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} - \\
& \quad \left. 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} \right) + \\
& x_2^3 y_1 y_3^2 \left( 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} \right) + \\
& 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_3^2 \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) +
\end{aligned}$$

$$\begin{aligned}
& 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_2^2 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_2^2 \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 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} + \\
& \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_2^2 \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 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} - \\
& \quad 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} - \\
& \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 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} \left. \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_3^2 y_2^3 \left( T^3 c_{2,13} - 3 T^4 c_{2,13} + 3 T^5 c_{2,13} - \right. \\
& \quad 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} \left. \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) + \\
& 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 T c_{2,15} - T^2 c_{2,15} + 3 c_{2,16} - 3 T c_{2,16} \left. \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_2^2 \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),
\end{aligned}$$

$$\begin{aligned}
 & - \frac{x_1 x_2 y_1^2 c_{1,2} c_{1,5}}{T^2} - \frac{x_1 x_2 y_1 y_2 c_{1,5}^2}{T^2} + \frac{x_2^2 y_1^2 (2 T c_{1,2}^2 + c_{1,2} c_{1,5} + T c_{1,2} c_{1,5})}{2 T^3} + \\
 & \frac{x_2^2 y_1 y_2 (2 T c_{1,2} c_{1,5} + c_{1,5}^2 + T c_{1,5}^2)}{2 T^3} + x_1^3 y_1 y_2^2 (c_{2,9} + T^2 d_{2,9} + 3 T^2 d_{2,13} - 3 T^3 d_{2,13}) + \\
 & x_1^3 y_1^3 (c_{2,1} + d_{2,1} + d_{2,5} - T d_{2,5} + d_{2,9} - 2 T d_{2,9} + T^2 d_{2,9} + d_{2,13} - 3 T d_{2,13} + 3 T^2 d_{2,13} - T^3 d_{2,13}) + \\
 & x_1^3 y_2^3 (c_{2,13} + T^3 d_{2,13}) + x_1^3 y_1^2 y_2 (c_{2,5} + T d_{2,5} + 2 T d_{2,9} - 2 T^2 d_{2,9} + 3 T d_{2,13} - 6 T^2 d_{2,13} + 3 T^3 d_{2,13}) + \\
 & \frac{x_1^2 x_2 y_1 y_2^2 (-3 c_{2,9} + 3 T c_{2,9} + c_{2,10} + T^3 d_{2,10} + 3 T^3 d_{2,14} - 3 T^4 d_{2,14})}{T} + \\
 & \frac{x_1^2 x_2 y_2^3 (-3 c_{2,13} + 3 T c_{2,13} + c_{2,14} + T^4 d_{2,14})}{T} + \frac{1}{T^2} \\
 & x_1^2 x_2 y_1^3 (c_{1,2} c_{1,5} - 3 T c_{2,1} + 3 T^2 c_{2,1} + T c_{2,2} + T^2 d_{2,2} + T^2 d_{2,6} - T^3 d_{2,6} + T^2 d_{2,10} - \\
 & 2 T^3 d_{2,10} + T^4 d_{2,10} + T^2 d_{2,14} - 3 T^3 d_{2,14} + 3 T^4 d_{2,14} - T^5 d_{2,14}) + \frac{1}{T^2} x_1^2 x_2 y_1^2 y_2 \\
 & (c_{1,5}^2 - 3 T c_{2,5} + 3 T^2 c_{2,5} + T c_{2,6} + T^3 d_{2,6} + 2 T^3 d_{2,10} - 2 T^4 d_{2,10} + 3 T^3 d_{2,14} - 6 T^4 d_{2,14} + 3 T^5 d_{2,14}) + \\
 & \frac{x_1 x_2^2 y_1 y_2^2 (c_{1,5}^2 + 3 c_{2,9} - 6 T c_{2,9} + 3 T^2 c_{2,9} - 2 c_{2,10} + 2 T c_{2,10} + c_{2,11} + T^4 d_{2,11} + 3 T^4 d_{2,15} - 3 T^5 d_{2,15})}{T^2} \\
 & + \frac{x_1 x_2^2 y_2^3 (3 c_{2,13} - 6 T c_{2,13} + 3 T^2 c_{2,13} - 2 c_{2,14} + 2 T c_{2,14} + c_{2,15} + T^5 d_{2,15})}{T^2} + \\
 & \frac{1}{2 T^3} x_1 x_2^2 y_1^3 (2 T c_{1,2}^2 - 5 c_{1,2} c_{1,5} + 3 T c_{1,2} c_{1,5} - 2 c_{1,5}^2 + 2 T c_{1,5}^2 + 6 T c_{2,1} - \\
 & 12 T^2 c_{2,1} + 6 T^3 c_{2,1} - 4 T c_{2,2} + 4 T^2 c_{2,2} + 2 T c_{2,3} + 2 T^3 d_{2,3} + 2 T^3 d_{2,7} - 2 T^4 d_{2,7} + \\
 & 2 T^3 d_{2,11} - 4 T^4 d_{2,11} + 2 T^5 d_{2,11} + 2 T^3 d_{2,15} - 6 T^4 d_{2,15} + 6 T^5 d_{2,15} - 2 T^6 d_{2,15}) + \\
 & \frac{1}{2 T^3} x_1 x_2^2 y_1^2 y_2 (-3 c_{1,5}^2 - 3 T c_{1,5}^2 + 6 T c_{2,5} - 12 T^2 c_{2,5} + 6 T^3 c_{2,5} - 4 T c_{2,6} + 4 T^2 c_{2,6} + \\
 & 2 T c_{2,7} + 2 T^4 d_{2,7} + 4 T^4 d_{2,11} - 4 T^5 d_{2,11} + 6 T^4 d_{2,15} - 12 T^5 d_{2,15} + 6 T^6 d_{2,15}) + \frac{1}{2 T^3} \\
 & x_2^3 y_1 y_2^2 (-2 T c_{1,2} c_{1,5} - c_{1,5}^2 - T c_{1,5}^2 - 2 c_{2,9} + 6 T c_{2,9} - 6 T^2 c_{2,9} + 2 T^3 c_{2,9} + 2 c_{2,10} - \\
 & 4 T c_{2,10} + 2 T^2 c_{2,10} - 2 c_{2,11} + 2 T c_{2,11} + 2 c_{2,12} + 2 T^5 d_{2,12} + 6 T^5 d_{2,16} - 6 T^6 d_{2,16}) + \frac{1}{T^3} x_2^3 y_2^3 \\
 & (-c_{2,13} + 3 T c_{2,13} - 3 T^2 c_{2,13} + T^3 c_{2,13} + c_{2,14} - 2 T c_{2,14} + T^2 c_{2,14} - c_{2,15} + T c_{2,15} + c_{2,16} + T^6 d_{2,16}) + \\
 & \frac{1}{2 T^4} x_2^3 y_1^3 (2 c_{1,2} c_{1,5} - 2 T^2 c_{1,2} c_{1,5} + c_{1,5}^2 - T^2 c_{1,5}^2 - 2 T c_{2,1} + 6 T^2 c_{2,1} - 6 T^3 c_{2,1} + 2 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} + 2 T c_{2,4} + 2 T^4 d_{2,4} + 2 T^4 d_{2,8} - \\
 & 2 T^5 d_{2,8} + 2 T^4 d_{2,12} - 4 T^5 d_{2,12} + 2 T^6 d_{2,12} + 2 T^4 d_{2,16} - 6 T^5 d_{2,16} + 6 T^6 d_{2,16} - 2 T^7 d_{2,16}) + \\
 & \frac{1}{2 T^4} x_2^3 y_1^2 y_2 (2 T^2 c_{1,2}^2 - T c_{1,2} c_{1,5} + 7 T^2 c_{1,2} c_{1,5} + c_{1,5}^2 + 3 T^2 c_{1,5}^2 - 2 T c_{2,5} + 6 T^2 c_{2,5} - \\
 & 6 T^3 c_{2,5} + 2 T^4 c_{2,5} + 2 T c_{2,6} - 4 T^2 c_{2,6} + 2 T^3 c_{2,6} - 2 T c_{2,7} + 2 T^2 c_{2,7} + \\
 & 2 T c_{2,8} + 2 T^5 d_{2,8} + 4 T^5 d_{2,12} - 4 T^6 d_{2,12} + 6 T^5 d_{2,16} - 12 T^6 d_{2,16} + 6 T^7 d_{2,16}), \\
 & e_{2,1} + f_{2,1} + \frac{x_1 y_1 (c_{1,5}^2 + T^2 e_{2,2} + T^2 f_{2,2})}{T^2} + x_1^2 y_1^2 (e_{2,3} + f_{2,3}) + x_1^3 y_1^3 (e_{2,4} + f_{2,4}),
 \end{aligned}$$

$$\begin{aligned} & \frac{1}{T^4} \left( c_{1,5}^2 - 4 T c_{1,5}^2 + 3 T^2 c_{1,5}^2 - 6 T c_{2,4} + 6 T^4 c_{2,13} + T^4 e_{2,1} - T^3 e_{2,2} + T^4 e_{2,2} + \right. \\ & \quad \left. 2 T^2 e_{2,3} - 4 T^3 e_{2,3} + 2 T^4 e_{2,3} - 6 T e_{2,4} + 18 T^2 e_{2,4} - 18 T^3 e_{2,4} + 6 T^4 e_{2,4} - T^4 f_{2,1} \right) + \\ & \frac{1}{T^4} x_1 y_1 \left( 6 T^2 c_{1,2}^2 - 3 T c_{1,2} c_{1,5} + 9 T^2 c_{1,2} c_{1,5} - 2 c_{1,5}^2 + 2 T c_{1,5}^2 + 3 T^2 c_{1,5}^2 - T^3 c_{1,5}^2 + \right. \\ & \quad \left. 6 T^2 c_{2,3} + 18 T c_{2,4} + 2 T^2 c_{2,7} + 6 T c_{2,8} - 6 T^5 c_{2,9} - 2 T^4 c_{2,10} - 18 T^5 c_{2,13} - \right. \\ & \quad \left. 6 T^4 c_{2,14} + T^3 e_{2,2} - 4 T^2 e_{2,3} + 4 T^3 e_{2,3} + 18 T e_{2,4} - 36 T^2 e_{2,4} + 18 T^3 e_{2,4} - T^5 f_{2,2} \right) + \\ & \frac{1}{2 T^4} x_1^2 y_1^2 \left( -12 T^2 c_{1,2}^2 + 6 T c_{1,2} c_{1,5} - 18 T^2 c_{1,2} c_{1,5} + c_{1,5}^2 + 5 T c_{1,5}^2 - 7 T^2 c_{1,5}^2 + T^3 c_{1,5}^2 - \right. \\ & \quad \left. 6 T^3 c_{2,2} - 12 T^2 c_{2,3} - 18 T c_{2,4} + 6 T^6 c_{2,5} - 4 T^3 c_{2,6} + 4 T^5 c_{2,6} - 8 T^2 c_{2,7} + 2 T^4 c_{2,7} - \right. \\ & \quad \left. 12 T c_{2,8} + 12 T^6 c_{2,9} - 2 T^3 c_{2,10} + 8 T^5 c_{2,10} - 4 T^2 c_{2,11} + 4 T^4 c_{2,11} - 6 T c_{2,12} + \right. \\ & \quad \left. 18 T^6 c_{2,13} + 12 T^5 c_{2,14} + 6 T^4 c_{2,15} + 2 T^2 e_{2,3} - 18 T e_{2,4} + 18 T^2 e_{2,4} - 2 T^6 f_{2,3} \right) + \\ & \frac{1}{2 T^3} x_1^3 y_1^3 \left( 2 T c_{1,2}^2 - 2 T^4 c_{1,2}^2 - c_{1,2} c_{1,5} + 3 T c_{1,2} c_{1,5} + T^3 c_{1,2} c_{1,5} - 3 T^4 c_{1,2} c_{1,5} - c_{1,5}^2 + \right. \\ & \quad \left. T c_{1,5}^2 + T^3 c_{1,5}^2 - T^4 c_{1,5}^2 + 2 T^3 c_{2,1} - 2 T^6 c_{2,1} + 2 T^2 c_{2,2} - 2 T^5 c_{2,2} + 2 T c_{2,3} - 2 T^4 c_{2,3} + 2 c_{2,4} - \right. \\ & \quad \left. 2 T^3 c_{2,4} + 2 T^3 c_{2,5} - 2 T^6 c_{2,5} + 2 T^2 c_{2,6} - 2 T^5 c_{2,6} + 2 T c_{2,7} - 2 T^4 c_{2,7} + 2 c_{2,8} - 2 T^3 c_{2,8} + \right. \\ & \quad \left. 2 T^3 c_{2,9} - 2 T^6 c_{2,9} + 2 T^2 c_{2,10} - 2 T^5 c_{2,10} + 2 T c_{2,11} - 2 T^4 c_{2,11} + 2 c_{2,12} - 2 T^3 c_{2,12} + 2 T^3 c_{2,13} - \right. \\ & \quad \left. 2 T^6 c_{2,13} + 2 T^2 c_{2,14} - 2 T^5 c_{2,14} + 2 T c_{2,15} - 2 T^4 c_{2,15} + 2 c_{2,16} - 2 T^3 c_{2,16} + 2 e_{2,4} - 2 T^6 f_{2,4} \right) \end{aligned}$$

In[ ]:= **Solve** [  $-2 T c_{1,2}^2 + c_{1,2} c_{1,5} - 3 T c_{1,2} c_{1,5} + c_{1,5}^2 - T c_{1,5}^2 == 0, c_{1,2}$  ]

Out[ ]:=  $\left\{ \left\{ c_{1,2} \rightarrow -c_{1,5} \right\}, \left\{ c_{1,2} \rightarrow \frac{c_{1,5} - T c_{1,5}}{2 T} \right\} \right\}$

In[ ]:= **Solve** [  $(-2 T c_{1,2}^2 + 2 T^2 c_{1,2}^2 + c_{1,2} c_{1,5} - 4 T c_{1,2} c_{1,5} + 3 T^2 c_{1,2} c_{1,5} + c_{1,5}^2 - 2 T c_{1,5}^2 + T^2 c_{1,5}^2) == 0, c_{1,2}$  ]

Out[ ]:=  $\left\{ \left\{ c_{1,2} \rightarrow -c_{1,5} \right\}, \left\{ c_{1,2} \rightarrow \frac{c_{1,5} - T c_{1,5}}{2 T} \right\} \right\}$

In[ ]:= **\$k = 1**

Out[ ]:= **1**