

```
In[*]:= SetDirectory["C:\\drorbn\\AcademicPensieve\\Projects\\HigherRank\\Rolands_A2"];
Once[<< KnotTheory`];
<< ../Rot.m
<< ../FormalGaussianIntegration.m
```

Loading KnotTheory` version of February 2, 2020, 10:53:45.2097.

Read more at <http://katlas.org/wiki/KnotTheory>.

Loading Rot.m from <http://drorbn.net/AP/Projects/HigherRank> to compute rotation numbers.

Hidden code:

(*General input from A21rev.nb, hard coded!, we set α_4 to z to avoid a bug that mixes up the dummy variable α in an unexplained way :(*)

```
In[*]:= r0[1, i_, j_] := 
$$\frac{B(-c_{22} T_1 + c_{22} T_1 T_2 - T_2 \alpha_4) p_{3,j} x_{1,i} x_{2,i}}{\alpha_4} -$$


$$\frac{B c_{22} (-1 + T_2) p_{3,j} x_{1,j} x_{2,i}}{\alpha_4} + B p_{3,j} x_{1,i} x_{2,j} / . \alpha_4 \rightarrow z (*from r0p*)$$

r0[-1, i_, j_] :=

$$- \frac{B(-c_{22} + c_{22} T_2 - \alpha_4) p_{3,j} x_{1,i} x_{2,i}}{T_1 T_2 \alpha_4} + \frac{B c_{22} (-1 + T_2) p_{3,j} x_{1,j} x_{2,i}}{T_2 \alpha_4} - \frac{B p_{3,j} x_{1,i} x_{2,j}}{T_1} / . \alpha_4 \rightarrow z$$

r1[1, i_, j_] := 
$$-\frac{3}{2} + c_{15} p_{1,i} x_{1,i} + c_{36} p_{1,j} x_{1,i} + c_4 p_{1,i} p_{1,j} x_{1,i}^2 +$$


$$\frac{1}{2} (2 c_4 - T_1) (-1 + T_1) p_{1,j}^2 x_{1,i}^2 - \frac{(c_{15} + c_{36}) p_{1,j} x_{1,j}}{T_1} - p_{1,i} p_{1,j} x_{1,i} x_{1,j} +$$


$$\frac{1}{2} (1 - 2 c_4 + T_1) p_{1,j}^2 x_{1,i} x_{1,j} + c_{56} p_{2,i} x_{2,i} + c_{69} p_{2,j} x_{2,i} + c_{28} p_{1,j} p_{2,i} x_{1,i} x_{2,i} -$$


$$\left( (-c_{10} c_{22} - c_{22} c_{28} + c_{10} c_{22} T_1 + c_{22}^2 T_1 - c_{22} c_{81} T_1 - c_{22} c_{86} T_1 - c_{22} c_{56} T_1^2 - c_{22} c_{69} T_1^2 + 2 c_{10} c_{22} T_2 +$$


$$2 c_{22} c_{28} T_2 - 2 c_{10} c_{22} T_1 T_2 - c_{15} c_{22} T_1 T_2 - 2 c_{22}^2 T_1 T_2 - c_{22} c_{36} T_1 T_2 + 2 c_{22} c_{81} T_1 T_2 +$$


$$2 c_{22} c_{86} T_1 T_2 - 3 c_{22} T_1^2 T_2 + c_{15} c_{22} T_1^2 T_2 + 3 c_{22} c_{56} T_1^2 T_2 + 2 c_{22} c_{69} T_1^2 T_2 + c_{22} c_{81} T_1^2 T_2 -$$


$$c_{10} c_{22} T_2^2 - c_{22} c_{28} T_2^2 + c_{10} c_{22} T_1 T_2^2 + 2 c_{15} c_{22} T_1 T_2^2 + c_{22}^2 T_1 T_2^2 + 2 c_{22} c_{36} T_1 T_2^2 - c_{22} c_{81} T_1 T_2^2 -$$


$$c_{22} c_{86} T_1 T_2^2 + 6 c_{22} T_1^2 T_2^2 - 2 c_{15} c_{22} T_1^2 T_2^2 - 3 c_{22} c_{56} T_1^2 T_2^2 - c_{22} c_{69} T_1^2 T_2^2 - 2 c_{22} c_{81} T_1^2 T_2^2 -$$


$$c_{15} c_{22} T_1 T_2^3 - c_{22} c_{36} T_1 T_2^3 - 3 c_{22} T_1^2 T_2^3 + c_{15} c_{22} T_1^2 T_2^3 + c_{22} c_{56} T_1^2 T_2^3 + c_{22} c_{81} T_1^2 T_2^3 + c_{22} \alpha_4 -$$


$$c_{81} \alpha_4 - c_{86} \alpha_4 + c_{22} T_1 \alpha_4 - c_{56} T_1 \alpha_4 - c_{69} T_1 \alpha_4 - c_{10} T_2 \alpha_4 - c_{15} T_2 \alpha_4 - c_{22} T_2 \alpha_4 - c_{28} T_2 \alpha_4 -$$


$$c_{36} T_2 \alpha_4 + c_{81} T_2 \alpha_4 + c_{86} T_2 \alpha_4 - 3 T_1 T_2 \alpha_4 + c_{10} T_1 T_2 \alpha_4 + c_{15} T_1 T_2 \alpha_4 - c_{22} T_1 T_2 \alpha_4 +$$


$$2 c_{56} T_1 T_2 \alpha_4 + c_{69} T_1 T_2 \alpha_4 + c_{81} T_1 T_2 \alpha_4 + c_{10} T_2^2 \alpha_4 + c_{15} T_2^2 \alpha_4 + c_{28} T_2^2 \alpha_4 + c_{36} T_2^2 \alpha_4 +$$


$$3 T_1 T_2^2 \alpha_4 - c_{10} T_1 T_2^2 \alpha_4 - c_{15} T_1 T_2^2 \alpha_4 - c_{56} T_1 T_2^2 \alpha_4 - c_{81} T_1 T_2^2 \alpha_4 + \alpha_4^2) p_{1,i} p_{2,j} x_{1,i} x_{2,i} \right) /$$


$$1$$


$$\left( (-1 + T_1) (-c_{22} + c_{22} T_2 - T_2 \alpha_4) \right) - \frac{1}{-c_{22} + c_{22} T_2 - T_2 \alpha_4}$$


$$\left( -c_{10} c_{22} - 2 c_{22} c_{28} + c_{10} c_{22} T_1 + 2 c_{22}^2 T_1 - c_{22} c_{81} T_1 - c_{22} c_{86} T_1 - c_{22} c_{56} T_1^2 - c_{22} c_{69} T_1^2 +$$


$$2 c_{10} c_{22} T_2 + 4 c_{22} c_{28} T_2 - 2 c_{10} c_{22} T_1 T_2 - c_{15} c_{22} T_1 T_2 - 4 c_{22}^2 T_1 T_2 - c_{22} c_{36} T_1 T_2 +$$


$$3 c_{22} c_{81} T_1 T_2 + 3 c_{22} c_{86} T_1 T_2 - 3 c_{22} T_1^2 T_2 + c_{15} c_{22} T_1^2 T_2 + 4 c_{22} c_{56} T_1^2 T_2 + 3 c_{22} c_{69} T_1^2 T_2 +$$


$$c_{22} c_{81} T_1^2 T_2 - c_{10} c_{22} T_2^2 - 2 c_{22} c_{28} T_2^2 + c_{10} c_{22} T_1 T_2^2 + 3 c_{15} c_{22} T_1 T_2^2 + 2 c_{22}^2 T_1 T_2^2 +$$


$$3 c_{22} c_{36} T_1 T_2^2 - 2 c_{22} c_{81} T_1 T_2^2 - 2 c_{22} c_{86} T_1 T_2^2 + 9 c_{22} T_1^2 T_2^2 - 3 c_{15} c_{22} T_1^2 T_2^2 -$$


$$5 c_{22} c_{56} T_1^2 T_2^2 - 2 c_{22} c_{69} T_1^2 T_2^2 - 3 c_{22} c_{81} T_1^2 T_2^2 - 2 c_{15} c_{22} T_1 T_2^3 - 2 c_{22} c_{36} T_1 T_2^3 -$$

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$$\begin{aligned}
 & 6 c_{22} T_1^2 T_2^3 + 2 c_{15} c_{22} T_1^2 T_2^3 + 2 c_{22} c_{56} T_1^2 T_2^3 + 2 c_{22} c_{81} T_1^2 T_2^3 + c_{22} \alpha_4 - c_{81} \alpha_4 - c_{86} \alpha_4 + \\
 & c_{22} T_1 \alpha_4 - c_{56} T_1 \alpha_4 - c_{69} T_1 \alpha_4 - c_{10} T_2 \alpha_4 - c_{15} T_2 \alpha_4 - c_{22} T_2 \alpha_4 - 2 c_{28} T_2 \alpha_4 - c_{36} T_2 \alpha_4 + \\
 & 2 c_{81} T_2 \alpha_4 + 2 c_{86} T_2 \alpha_4 - 3 T_1 T_2 \alpha_4 + c_{10} T_1 T_2 \alpha_4 + c_{15} T_1 T_2 \alpha_4 - c_{22} T_1 T_2 \alpha_4 + 3 c_{56} T_1 T_2 \alpha_4 + \\
 & 2 c_{69} T_1 T_2 \alpha_4 + c_{81} T_1 T_2 \alpha_4 + c_{10} T_2^2 \alpha_4 + 2 c_{15} T_2^2 \alpha_4 + 2 c_{28} T_2^2 \alpha_4 + 2 c_{36} T_2^2 \alpha_4 + 6 T_1 T_2^2 \alpha_4 - \\
 & c_{10} T_1 T_2^2 \alpha_4 - 2 c_{15} T_1 T_2^2 \alpha_4 - 2 c_{56} T_1 T_2^2 \alpha_4 - 2 c_{81} T_1 T_2^2 \alpha_4 + \alpha_4^2 - T_2 \alpha_4^2) p_{1,j} p_{2,j} x_{1,i} x_{2,i} - \\
 & \left((c_{10} c_{22} + c_{22}^2 - c_{22} c_{81} - c_{22} c_{86} - c_{10} c_{22} T_1 - c_{22}^2 T_1 - c_{22} c_{56} T_1 - c_{22} c_{69} T_1 + c_{22} c_{81} T_1 + \right. \\
 & \quad c_{22} c_{86} T_1 + c_{22} c_{56} T_1^2 + c_{22} c_{69} T_1^2 - c_{10} c_{22} T_2 - c_{15} c_{22} T_2 - c_{22}^2 T_2 - c_{22} c_{36} T_2 + c_{22} c_{81} T_2 + \\
 & \quad c_{22} c_{86} T_2 - 3 c_{22} T_1 T_2 + c_{10} c_{22} T_1 T_2 + 2 c_{15} c_{22} T_1 T_2 + c_{22}^2 T_1 T_2 + c_{22} c_{36} T_1 T_2 + \\
 & \quad 2 c_{22} c_{56} T_1 T_2 + c_{22} c_{69} T_1 T_2 - c_{22} c_{86} T_1 T_2 + 3 c_{22} T_1^2 T_2 - c_{15} c_{22} T_1^2 T_2 - 2 c_{22} c_{56} T_1^2 T_2 - \\
 & \quad c_{22} c_{69} T_1^2 T_2 - c_{22} c_{81} T_1^2 T_2 + c_{15} c_{22} T_2^2 + c_{22} c_{36} T_2^2 + 3 c_{22} T_1 T_2^2 - 2 c_{15} c_{22} T_1 T_2^2 - c_{22} c_{36} T_1 T_2^2 - \\
 & \quad c_{22} c_{56} T_1 T_2^2 - c_{22} c_{81} T_1 T_2^2 - 3 c_{22} T_1^2 T_2^2 + c_{15} c_{22} T_1^2 T_2^2 + c_{22} c_{56} T_1^2 T_2^2 + c_{22} c_{81} T_1^2 T_2^2 + c_{81} \alpha_4 + \\
 & \quad c_{86} \alpha_4 - c_{22} T_1 \alpha_4 + c_{56} T_1 \alpha_4 + c_{69} T_1 \alpha_4 + c_{10} T_2 \alpha_4 + c_{15} T_2 \alpha_4 + c_{22} T_2 \alpha_4 + c_{36} T_2 \alpha_4 - \\
 & \quad c_{81} T_2 \alpha_4 - c_{86} T_2 \alpha_4 + 3 T_1 T_2 \alpha_4 - c_{10} T_1 T_2 \alpha_4 - c_{15} T_1 T_2 \alpha_4 - 2 c_{56} T_1 T_2 \alpha_4 - c_{69} T_1 T_2 \alpha_4 - \\
 & \quad \left. c_{81} T_1 T_2 \alpha_4 - c_{15} T_2^2 \alpha_4 - c_{36} T_2^2 \alpha_4 - 3 T_1 T_2^2 \alpha_4 + c_{15} T_1 T_2^2 \alpha_4 + c_{56} T_1 T_2^2 \alpha_4 + c_{81} T_1 T_2^2 \alpha_4 - \alpha_4^2) \right) \\
 & p_{1,j} p_{2,i} x_{1,j} x_{2,i} / ((-1 + T_1) (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) + \\
 & ((-1 + T_2) (c_{22} c_{28} + c_{22} c_{81} + c_{22} c_{86} - c_{22}^2 T_1 + c_{22} c_{56} T_1 + c_{22} c_{69} T_1 + c_{15} c_{22} T_2 - c_{22} c_{28} T_2 + \\
 & \quad c_{22} c_{36} T_2 + 3 c_{22} T_1 T_2 - c_{15} c_{22} T_1 T_2 + c_{22}^2 T_1 T_2 - c_{22} c_{56} T_1 T_2 - 2 c_{22} c_{81} T_1 T_2 - \\
 & \quad c_{22} c_{86} T_1 T_2 - c_{22} c_{56} T_1^2 T_2 - c_{22} c_{69} T_1^2 T_2 - c_{15} c_{22} T_1 T_2^2 - c_{22} c_{36} T_1 T_2^2 - 3 c_{22} T_1^2 T_2^2 + \\
 & \quad c_{15} c_{22} T_1^2 T_2^2 + c_{22} c_{56} T_1^2 T_2^2 + c_{22} c_{81} T_1^2 T_2^2 - c_{22} \alpha_4 + c_{28} T_2 \alpha_4) p_{1,j} p_{2,j} x_{1,j} x_{2,i}) / \\
 & ((-1 + T_1) (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) + c_{49} p_{2,i} p_{2,j} x_{2,i}^2 + \frac{1}{2} (2 c_{49} - T_2) \\
 & (-1 + T_2) p_{2,j}^2 x_{2,i}^2 - \\
 & \frac{(c_{56} + c_{69}) p_{2,j} x_{2,j}}{T_2} + c_{10} p_{1,i} p_{2,j} x_{1,i} x_{2,j} + \\
 & \frac{1}{1} \\
 & -c_{22} + c_{22} T_2 - T_2 \alpha_4 \\
 & (c_{10} c_{22} + c_{22} c_{28} - c_{10} c_{22} T_1 - c_{22}^2 T_1 + c_{22} c_{81} T_1 + c_{22} c_{86} T_1 + c_{22} c_{56} T_1^2 + c_{22} c_{69} T_1^2 - \\
 & \quad c_{10} c_{22} T_2 - c_{22} c_{28} T_2 + c_{10} c_{22} T_1 T_2 + c_{15} c_{22} T_1 T_2 + c_{22}^2 T_1 T_2 + c_{22} c_{36} T_1 T_2 - c_{22} c_{81} T_1 T_2 - \\
 & \quad c_{22} c_{86} T_1 T_2 + 3 c_{22} T_1^2 T_2 - c_{15} c_{22} T_1^2 T_2 - 2 c_{22} c_{56} T_1^2 T_2 - c_{22} c_{69} T_1^2 T_2 - c_{22} c_{81} T_1^2 T_2 - \\
 & \quad c_{15} c_{22} T_1 T_2^2 - c_{22} c_{36} T_1 T_2^2 - 3 c_{22} T_1^2 T_2^2 + c_{15} c_{22} T_1^2 T_2^2 + c_{22} c_{56} T_1^2 T_2^2 + c_{22} c_{81} T_1^2 T_2^2 + \\
 & \quad c_{81} \alpha_4 + c_{86} \alpha_4 - c_{22} T_1 \alpha_4 + c_{56} T_1 \alpha_4 + c_{69} T_1 \alpha_4 + c_{10} T_2 \alpha_4 + c_{15} T_2 \alpha_4 + c_{28} T_2 \alpha_4 + \\
 & \quad c_{36} T_2 \alpha_4 + 3 T_1 T_2 \alpha_4 - c_{10} T_1 T_2 \alpha_4 - c_{15} T_1 T_2 \alpha_4 - c_{56} T_1 T_2 \alpha_4 - c_{81} T_1 T_2 \alpha_4 - \alpha_4^2) \\
 & p_{1,j} p_{2,j} x_{1,i} x_{2,j} - p_{2,i} p_{2,j} x_{2,i} x_{2,j} + \frac{1}{2} (1 - 2 c_{49} + T_2) p_{2,j}^2 x_{2,i} x_{2,j} + \\
 & \frac{1}{B (c_{22} - c_{22} T_2 + T_2 \alpha_4)} (c_{81} + c_{86} - c_{22} T_1 + c_{56} T_1 + c_{69} T_1 + c_{15} T_2 + c_{36} T_2 + \\
 & \quad 3 T_1 T_2 - c_{15} T_1 T_2 + c_{22} T_1 T_2 - c_{56} T_1 T_2 - 2 c_{81} T_1 T_2 - c_{86} T_1 T_2 - c_{56} T_1^2 T_2 - \\
 & \quad c_{69} T_1^2 T_2 - c_{15} T_1 T_2^2 - c_{36} T_1 T_2^2 - 3 T_1^2 T_2^2 + c_{15} T_1^2 T_2^2 + c_{56} T_1^2 T_2^2 + c_{81} T_1^2 T_2^2 - \alpha_4) \\
 & \alpha_4 p_{1,j} p_{2,i} x_{3,i} + \frac{\alpha_4 p_{1,i} p_{2,j} x_{3,i}}{B} - \frac{1}{B (c_{22} - c_{22} T_2 + T_2 \alpha_4)} \alpha_4 \\
 & (c_{22} + c_{81} + c_{86} - c_{22} T_1 + c_{56} T_1 + c_{69} T_1 + c_{15} T_2 - c_{22} T_2 + c_{36} T_2 + 3 T_1 T_2 - c_{15} T_1 T_2 + \\
 & \quad c_{22} T_1 T_2 - c_{56} T_1 T_2 - 2 c_{81} T_1 T_2 - c_{86} T_1 T_2 - c_{56} T_1^2 T_2 - c_{69} T_1^2 T_2 - c_{15} T_1 T_2^2 - \\
 & \quad c_{36} T_1 T_2^2 - 3 T_1^2 T_2^2 + c_{15} T_1^2 T_2^2 + c_{56} T_1^2 T_2^2 + c_{81} T_1^2 T_2^2 - \alpha_4 + T_2 \alpha_4) p_{1,j} p_{2,j} x_{3,i} + \\
 & c_{81} p_{3,i} x_{3,i} + c_{86} p_{3,j} x_{3,i} + c_{32} p_{1,j} p_{3,i} x_{1,i} x_{3,i} + c_{13} p_{1,i} p_{3,j} x_{1,i} x_{3,i} +
 \end{aligned}$$

1

$$\begin{aligned}
 & -c_{22} + c_{22} T_2 - T_2 \alpha_4 \\
 & \left(c_{13} c_{22} + c_{22} c_{32} - c_{13} c_{22} T_1 + c_{22}^2 T_1 - c_{22} c_{81} T_1 - c_{22} c_{86} T_1 - c_{22} c_{56} T_1^2 - c_{22} c_{69} T_1^2 - \right. \\
 & \quad c_{13} c_{22} T_2 - c_{22} c_{32} T_2 + c_{13} c_{22} T_1 T_2 - c_{15} c_{22} T_1 T_2 - c_{22}^2 T_1 T_2 - c_{22} c_{32} T_1 T_2 - c_{22} c_{36} T_1 T_2 + \\
 & \quad c_{22} c_{81} T_1 T_2 + c_{22} c_{86} T_1 T_2 - 3 c_{22} T_1^2 T_2 + c_{15} c_{22} T_1^2 T_2 - c_{22}^2 T_1^2 T_2 + 2 c_{22} c_{56} T_1^2 T_2 + \\
 & \quad c_{22} c_{69} T_1^2 T_2 + 2 c_{22} c_{81} T_1^2 T_2 + c_{22} c_{86} T_1^2 T_2 + c_{22} c_{56} T_1^3 T_2 + c_{22} c_{69} T_1^3 T_2 + c_{15} c_{22} T_1 T_2^2 + \\
 & \quad c_{22} c_{32} T_1 T_2^2 + c_{22} c_{36} T_1 T_2^2 + 3 c_{22} T_1^2 T_2^2 + c_{22}^2 T_1^2 T_2^2 + c_{22} c_{36} T_1^2 T_2^2 - c_{22} c_{56} T_1^2 T_2^2 - \\
 & \quad 2 c_{22} c_{81} T_1^2 T_2^2 - c_{22} c_{86} T_1^2 T_2^2 + 3 c_{22} T_1^3 T_2^2 - c_{15} c_{22} T_1^3 T_2^2 - 2 c_{22} c_{56} T_1^3 T_2^2 - c_{22} c_{69} T_1^3 T_2^2 - \\
 & \quad c_{22} c_{81} T_1^3 T_2^2 - c_{15} c_{22} T_1^2 T_2^3 - c_{22} c_{36} T_1^2 T_2^3 - 3 c_{22} T_1^3 T_2^3 + c_{15} c_{22} T_1^3 T_2^3 + c_{22} c_{56} T_1^3 T_2^3 + \\
 & \quad c_{22} c_{81} T_1^3 T_2^3 - c_{81} \alpha_4 - c_{86} \alpha_4 + c_{22} T_1 \alpha_4 - c_{56} T_1 \alpha_4 - c_{69} T_1 \alpha_4 + c_{13} T_2 \alpha_4 - c_{15} T_2 \alpha_4 + \\
 & \quad c_{32} T_2 \alpha_4 - c_{36} T_2 \alpha_4 - 3 T_1 T_2 \alpha_4 - c_{13} T_1 T_2 \alpha_4 + c_{15} T_1 T_2 \alpha_4 + c_{56} T_1 T_2 \alpha_4 + 2 c_{81} T_1 T_2 \alpha_4 + \\
 & \quad c_{86} T_1 T_2 \alpha_4 - c_{22} T_1^2 T_2 \alpha_4 + c_{56} T_1^2 T_2 \alpha_4 + c_{69} T_1^2 T_2 \alpha_4 + c_{15} T_1 T_2^2 \alpha_4 - c_{32} T_1 T_2^2 \alpha_4 + c_{36} T_1 T_2^2 \alpha_4 + \\
 & \quad \left. 3 T_1^2 T_2^2 \alpha_4 - c_{15} T_1^2 T_2^2 \alpha_4 - c_{56} T_1^2 T_2^2 \alpha_4 - c_{81} T_1^2 T_2^2 \alpha_4 + \alpha_4^2 - T_1 T_2 \alpha_4^2 \right) p_{1,j} p_{3,j} x_{1,i} x_{3,i} + \\
 & \frac{1}{(-1 + T_1) (-1 + T_1 T_2)} \left(-c_{13} + c_{22} + c_{32} - c_{81} - c_{86} + c_{13} T_1 - c_{22} T_1 - c_{56} T_1 - c_{69} T_1 + \right. \\
 & \quad c_{22} T_1^2 - c_{15} T_2 - c_{36} T_2 - 3 T_1 T_2 + c_{15} T_1 T_2 - c_{22} T_1 T_2 - c_{32} T_1 T_2 + c_{56} T_1 T_2 + \\
 & \quad \left. 2 c_{81} T_1 T_2 + c_{86} T_1 T_2 + c_{56} T_1^2 T_2 + c_{69} T_1^2 T_2 + c_{15} T_1 T_2^2 + c_{36} T_1 T_2^2 + 3 T_1^2 T_2^2 - \right. \\
 & \quad \left. c_{15} T_1^2 T_2^2 - c_{56} T_1^2 T_2^2 - c_{81} T_1^2 T_2^2 + T_1 \alpha_4 \right) p_{1,j} p_{3,i} x_{1,j} x_{3,i} + c_{22} p_{1,i} p_{3,j} x_{1,j} x_{3,i} - \\
 & \left((c_{22}^2 + c_{22} c_{32} - c_{22}^2 T_1 - c_{22} c_{81} T_1 - c_{22} c_{86} T_1 + c_{22}^2 T_1^2 - c_{22} c_{56} T_1^2 - c_{22} c_{69} T_1^2 - c_{22}^2 T_2 - \right. \\
 & \quad c_{22} c_{32} T_2 - c_{15} c_{22} T_1 T_2 + c_{22}^2 T_1 T_2 - c_{22} c_{32} T_1 T_2 - c_{22} c_{36} T_1 T_2 + c_{22} c_{81} T_1 T_2 + \\
 & \quad c_{22} c_{86} T_1 T_2 - 3 c_{22} T_1^2 T_2 + c_{15} c_{22} T_1^2 T_2 - 2 c_{22}^2 T_1^2 T_2 + 2 c_{22} c_{56} T_1^2 T_2 + c_{22} c_{69} T_1^2 T_2 + \\
 & \quad \left. 2 c_{22} c_{81} T_1^2 T_2 + c_{22} c_{86} T_1^2 T_2 + c_{22} c_{56} T_1^3 T_2 + c_{22} c_{69} T_1^3 T_2 + c_{15} c_{22} T_1 T_2^2 + c_{22} c_{32} T_1 T_2^2 + \right. \\
 & \quad c_{22} c_{36} T_1 T_2^2 + 3 c_{22} T_1^2 T_2^2 + c_{22}^2 T_1^2 T_2^2 + c_{22} c_{36} T_1^2 T_2^2 - c_{22} c_{56} T_1^2 T_2^2 - 2 c_{22} c_{81} T_1^2 T_2^2 - \\
 & \quad c_{22} c_{86} T_1^2 T_2^2 + 3 c_{22} T_1^3 T_2^2 - c_{15} c_{22} T_1^3 T_2^2 - 2 c_{22} c_{56} T_1^3 T_2^2 - c_{22} c_{69} T_1^3 T_2^2 - c_{22} c_{81} T_1^3 T_2^2 - \\
 & \quad c_{15} c_{22} T_1^2 T_2^3 - c_{22} c_{36} T_1^2 T_2^3 - 3 c_{22} T_1^3 T_2^3 + c_{15} c_{22} T_1^3 T_2^3 + c_{22} c_{56} T_1^3 T_2^3 + c_{22} c_{81} T_1^3 T_2^3 + \\
 & \quad \left. c_{22} T_1 \alpha_4 + c_{22} T_2 \alpha_4 + c_{32} T_2 \alpha_4 - 2 c_{22} T_1 T_2 \alpha_4 - c_{32} T_1 T_2^2 \alpha_4 \right) p_{1,j} p_{3,j} x_{1,j} x_{3,i} \Big/ \\
 & \left((-1 + T_1) (-c_{22} + c_{22} T_2 - T_2 \alpha_4) \right) + c_{65} p_{2,j} p_{3,i} x_{2,i} x_{3,i} + c_{54} p_{2,i} p_{3,j} x_{2,i} x_{3,i} + \\
 & \left((c_{22}^2 - c_{22} c_{54} - c_{22} c_{65} - c_{22}^2 T_1 + c_{22} c_{54} T_1 + c_{22} c_{65} T_1 - 2 c_{22}^2 T_2 + 2 c_{22} c_{54} T_2 + c_{22} c_{65} T_2 + \right. \\
 & \quad c_{22} c_{81} T_2 + c_{22} c_{86} T_2 + c_{22}^2 T_1 T_2 - 2 c_{22} c_{54} T_1 T_2 + c_{22} c_{56} T_1 T_2 + c_{22} c_{69} T_1 T_2 - c_{22} c_{81} T_1 T_2 - \\
 & \quad c_{22} c_{86} T_1 T_2 + c_{22}^2 T_1^2 T_2 - c_{22} c_{56} T_1^2 T_2 - c_{22} c_{65} T_1^2 T_2 - c_{22} c_{69} T_1^2 T_2 + c_{15} c_{22} T_2^2 + c_{22}^2 T_2^2 + \\
 & \quad c_{22} c_{36} T_2^2 - c_{22} c_{54} T_2^2 - c_{22} c_{81} T_2^2 - c_{22} c_{86} T_2^2 + 3 c_{22} T_1 T_2^2 - 2 c_{15} c_{22} T_1 T_2^2 + c_{22}^2 T_1 T_2^2 - \\
 & \quad c_{22} c_{36} T_1 T_2^2 + c_{22} c_{54} T_1 T_2^2 - 2 c_{22} c_{56} T_1 T_2^2 - c_{22} c_{65} T_1 T_2^2 - c_{22} c_{69} T_1 T_2^2 - c_{22} c_{81} T_1 T_2^2 - \\
 & \quad \left. 3 c_{22} T_1^2 T_2^2 + c_{15} c_{22} T_1^2 T_2^2 - 2 c_{22}^2 T_1^2 T_2^2 + c_{22} c_{56} T_1^2 T_2^2 + c_{22} c_{65} T_1^2 T_2^2 + 2 c_{22} c_{81} T_1^2 T_2^2 + \right. \\
 & \quad c_{22} c_{86} T_1^2 T_2^2 + c_{22} c_{56} T_1^3 T_2^2 + c_{22} c_{69} T_1^3 T_2^2 - c_{15} c_{22} T_2^3 - c_{22} c_{36} T_2^3 - 3 c_{22} T_1 T_2^3 + c_{15} c_{22} T_1 T_2^3 - \\
 & \quad c_{22}^2 T_1 T_2^3 + c_{22} c_{56} T_1 T_2^3 + 2 c_{22} c_{81} T_1 T_2^3 + c_{22} c_{86} T_1 T_2^3 + c_{15} c_{22} T_1^2 T_2^3 + c_{22}^2 T_1^2 T_2^3 + c_{22} c_{36} T_1^2 T_2^3 + \\
 & \quad c_{22} c_{56} T_1^2 T_2^3 + c_{22} c_{69} T_1^2 T_2^3 - c_{22} c_{81} T_1^2 T_2^3 - c_{22} c_{86} T_1^2 T_2^3 + 3 c_{22} T_1^3 T_2^3 - c_{15} c_{22} T_1^3 T_2^3 - \\
 & \quad \left. 2 c_{22} c_{56} T_1^3 T_2^3 - c_{22} c_{69} T_1^3 T_2^3 - c_{22} c_{81} T_1^3 T_2^3 + c_{15} c_{22} T_1 T_2^4 + c_{22} c_{36} T_1 T_2^4 + 3 c_{22} T_1^2 T_2^4 - \right. \\
 & \quad 2 c_{15} c_{22} T_1^2 T_2^4 - c_{22} c_{36} T_1^2 T_2^4 - c_{22} c_{56} T_1^2 T_2^4 - c_{22} c_{81} T_1^2 T_2^4 - 3 c_{22} T_1^3 T_2^4 + c_{15} c_{22} T_1^3 T_2^4 + \\
 & \quad c_{22} c_{56} T_1^3 T_2^4 + c_{22} c_{81} T_1^3 T_2^4 + c_{22} T_2 \alpha_4 - c_{54} T_2 \alpha_4 - c_{65} T_2 \alpha_4 - c_{81} T_2 \alpha_4 - c_{86} T_2 \alpha_4 + \\
 & \quad c_{54} T_1 T_2 \alpha_4 - c_{56} T_1 T_2 \alpha_4 + c_{65} T_1 T_2 \alpha_4 - c_{69} T_1 T_2 \alpha_4 - c_{15} T_2^2 \alpha_4 - c_{22} T_2^2 \alpha_4 - c_{36} T_2^2 \alpha_4 + \\
 & \quad c_{54} T_2^2 \alpha_4 + c_{81} T_2^2 \alpha_4 + c_{86} T_2^2 \alpha_4 - 3 T_1 T_2^2 \alpha_4 + c_{15} T_1 T_2^2 \alpha_4 - c_{22} T_1 T_2^2 \alpha_4 - c_{54} T_1 T_2^2 \alpha_4 + \\
 & \quad \left. 2 c_{56} T_1 T_2^2 \alpha_4 + c_{65} T_1 T_2^2 \alpha_4 + c_{69} T_1 T_2^2 \alpha_4 + 2 c_{81} T_1 T_2^2 \alpha_4 + c_{86} T_1 T_2^2 \alpha_4 + c_{56} T_1^2 T_2^2 \alpha_4 - \right. \\
 & \quad c_{65} T_1^2 T_2^2 \alpha_4 + c_{69} T_1^2 T_2^2 \alpha_4 + c_{15} T_2^3 \alpha_4 + c_{36} T_2^3 \alpha_4 + 3 T_1 T_2^3 \alpha_4 + c_{22} T_1 T_2^3 \alpha_4 + c_{36} T_1 T_2^3 \alpha_4 - \\
 & \quad c_{56} T_1 T_2^3 \alpha_4 - 2 c_{81} T_1 T_2^3 \alpha_4 - c_{86} T_1 T_2^3 \alpha_4 + 3 T_1^2 T_2^3 \alpha_4 - c_{15} T_1^2 T_2^3 \alpha_4 - 2 c_{56} T_1^2 T_2^3 \alpha_4 - \\
 & \quad \left. c_{69} T_1^2 T_2^3 \alpha_4 - c_{81} T_1^2 T_2^3 \alpha_4 - c_{15} T_1 T_2^4 \alpha_4 - c_{36} T_1 T_2^4 \alpha_4 - 3 T_1^2 T_2^4 \alpha_4 + c_{15} T_1^2 T_2^4 \alpha_4 + c_{56} T_1^2 T_2^4 \alpha_4 + \right.
 \end{aligned}$$

$$\begin{aligned}
 & (c_{81} T_1^2 T_2^4 \alpha_4 + T_2 \alpha_4^2 - T_1 T_2^2 \alpha_4^2) p_{2,j} p_{3,j} x_{2,i} x_{3,i} / ((-1 + T_1) (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) + \\
 & ((-c_{22} c_{54} + c_{22} c_{65} - c_{22} c_{81} - c_{22} c_{86} + c_{22} c_{54} T_1 - c_{22} c_{56} T_1 - c_{22} c_{65} T_1 - c_{22} c_{69} T_1 + \\
 & c_{22} c_{81} T_1 + c_{22} c_{86} T_1 + c_{22} c_{56} T_1^2 + c_{22} c_{69} T_1^2 - c_{15} c_{22} T_2 - c_{22} c_{36} T_2 + 2 c_{22} c_{54} T_2 - \\
 & c_{22} c_{65} T_2 + 2 c_{22} c_{81} T_2 + 2 c_{22} c_{86} T_2 - 3 c_{22} T_1 T_2 + 2 c_{15} c_{22} T_1 T_2 - c_{22}^2 T_1 T_2 + c_{22} c_{36} T_1 T_2 - \\
 & 2 c_{22} c_{54} T_1 T_2 + 3 c_{22} c_{56} T_1 T_2 + 2 c_{22} c_{69} T_1 T_2 - c_{22} c_{86} T_1 T_2 + 3 c_{22} T_1^2 T_2 - c_{15} c_{22} T_1^2 T_2 + \\
 & c_{22}^2 T_1^2 T_2 - 2 c_{22} c_{56} T_1^2 T_2 + c_{22} c_{65} T_1^2 T_2 - c_{22} c_{69} T_1^2 T_2 - 2 c_{22} c_{81} T_1^2 T_2 - c_{22} c_{86} T_1^2 T_2 - \\
 & c_{22} c_{56} T_1^3 T_2 - c_{22} c_{69} T_1^3 T_2 + 2 c_{15} c_{22} T_2^2 + 2 c_{22} c_{36} T_2^2 - c_{22} c_{54} T_2^2 - c_{22} c_{81} T_2^2 - c_{22} c_{86} T_2^2 + \\
 & 6 c_{22} T_1 T_2^2 - 3 c_{15} c_{22} T_1 T_2^2 + 2 c_{22}^2 T_1 T_2^2 - c_{22} c_{36} T_1 T_2^2 + c_{22} c_{54} T_1 T_2^2 - 3 c_{22} c_{56} T_1 T_2^2 + \\
 & c_{22} c_{65} T_1 T_2^2 - c_{22} c_{69} T_1 T_2^2 - 3 c_{22} c_{81} T_1 T_2^2 - c_{22} c_{86} T_1 T_2^2 - 3 c_{22} T_1^2 T_2^2 - 2 c_{22}^2 T_1^2 T_2^2 - \\
 & c_{22} c_{36} T_1^2 T_2^2 - c_{22} c_{65} T_1^2 T_2^2 - c_{22} c_{69} T_1^2 T_2^2 + 3 c_{22} c_{81} T_1^2 T_2^2 + 2 c_{22} c_{86} T_1^2 T_2^2 - 3 c_{22} T_1^3 T_2^2 + \\
 & c_{15} c_{22} T_1^3 T_2^2 + 3 c_{22} c_{56} T_1^3 T_2^2 + 2 c_{22} c_{69} T_1^3 T_2^2 + c_{22} c_{81} T_1^3 T_2^2 - c_{15} c_{22} T_2^3 - c_{22} c_{36} T_2^3 - \\
 & 3 c_{22} T_1 T_2^3 - c_{22}^2 T_1 T_2^3 - c_{22} c_{36} T_1 T_2^3 + c_{22} c_{56} T_1 T_2^3 + 2 c_{22} c_{81} T_1 T_2^3 + c_{22} c_{86} T_1 T_2^3 - 3 c_{22} T_1^2 T_2^3 + \\
 & 3 c_{15} c_{22} T_1^2 T_2^3 + c_{22}^2 T_1^2 T_2^3 + 2 c_{22} c_{36} T_1^2 T_2^3 + 2 c_{22} c_{56} T_1^2 T_2^3 + c_{22} c_{69} T_1^2 T_2^3 - c_{22} c_{81} T_1^2 T_2^3 + \\
 & 6 c_{22} T_1^3 T_2^3 - 2 c_{15} c_{22} T_1^3 T_2^3 - 3 c_{22} c_{56} T_1^3 T_2^3 - c_{22} c_{69} T_1^3 T_2^3 - 2 c_{22} c_{81} T_1^3 T_2^3 + c_{15} c_{22} T_1 T_2^4 + \\
 & c_{22} c_{36} T_1 T_2^4 + 3 c_{22} T_1^2 T_2^4 - 2 c_{15} c_{22} T_1^2 T_2^4 - c_{22} c_{36} T_1^2 T_2^4 - c_{22} c_{56} T_1^2 T_2^4 - c_{22} c_{81} T_1^2 T_2^4 - \\
 & 3 c_{22} T_1^3 T_2^4 + c_{15} c_{22} T_1^3 T_2^4 + c_{22} c_{56} T_1^3 T_2^4 + c_{22} c_{81} T_1^3 T_2^4 + c_{81} \alpha_4 + c_{86} \alpha_4 - c_{22} T_1 \alpha_4 + c_{56} T_1 \alpha_4 + \\
 & c_{69} T_1 \alpha_4 + c_{15} T_2 \alpha_4 - c_{22} T_2 \alpha_4 + c_{36} T_2 \alpha_4 - c_{54} T_2 \alpha_4 + c_{65} T_2 \alpha_4 - 2 c_{81} T_2 \alpha_4 - 2 c_{86} T_2 \alpha_4 + \\
 & 3 T_1 T_2 \alpha_4 - c_{15} T_1 T_2 \alpha_4 + 3 c_{22} T_1 T_2 \alpha_4 + c_{54} T_1 T_2 \alpha_4 - 3 c_{56} T_1 T_2 \alpha_4 - c_{65} T_1 T_2 \alpha_4 - \\
 & 2 c_{69} T_1 T_2 \alpha_4 - 2 c_{81} T_1 T_2 \alpha_4 - c_{86} T_1 T_2 \alpha_4 + c_{22} T_1^2 T_2 \alpha_4 - c_{56} T_1^2 T_2 \alpha_4 - c_{69} T_1^2 T_2 \alpha_4 - \\
 & 2 c_{15} T_2^2 \alpha_4 + c_{22} T_2^2 \alpha_4 - 2 c_{36} T_2^2 \alpha_4 + c_{54} T_2^2 \alpha_4 + c_{81} T_2^2 \alpha_4 + c_{86} T_2^2 \alpha_4 - 6 T_1 T_2^2 \alpha_4 + c_{15} T_1 T_2^2 \alpha_4 - \\
 & 3 c_{22} T_1 T_2^2 \alpha_4 - c_{36} T_1 T_2^2 \alpha_4 - c_{54} T_1 T_2^2 \alpha_4 + 3 c_{56} T_1 T_2^2 \alpha_4 - c_{65} T_1 T_2^2 \alpha_4 + c_{69} T_1 T_2^2 \alpha_4 + \\
 & 4 c_{81} T_1 T_2^2 \alpha_4 + 2 c_{86} T_1 T_2^2 \alpha_4 - 3 T_1^2 T_2^2 \alpha_4 + c_{15} T_1^2 T_2^2 \alpha_4 - c_{22} T_1^2 T_2^2 \alpha_4 + 3 c_{56} T_1^2 T_2^2 \alpha_4 + \\
 & c_{65} T_1^2 T_2^2 \alpha_4 + 2 c_{69} T_1^2 T_2^2 \alpha_4 + c_{81} T_1^2 T_2^2 \alpha_4 + c_{15} T_2^3 \alpha_4 + c_{36} T_2^3 \alpha_4 + 3 T_1 T_2^3 \alpha_4 + c_{15} T_1 T_2^3 \alpha_4 + \\
 & c_{22} T_1 T_2^3 \alpha_4 + 2 c_{36} T_1 T_2^3 \alpha_4 - c_{56} T_1 T_2^3 \alpha_4 - 2 c_{81} T_1 T_2^3 \alpha_4 - c_{86} T_1 T_2^3 \alpha_4 + 6 T_1^2 T_2^3 \alpha_4 - \\
 & 2 c_{15} T_1^2 T_2^3 \alpha_4 - 3 c_{56} T_1^2 T_2^3 \alpha_4 - c_{69} T_1^2 T_2^3 \alpha_4 - 2 c_{81} T_1^2 T_2^3 \alpha_4 - c_{15} T_1 T_2^4 \alpha_4 - c_{36} T_1 T_2^4 \alpha_4 - \\
 & 3 T_1^2 T_2^4 \alpha_4 + c_{15} T_1^2 T_2^4 \alpha_4 + c_{56} T_1^2 T_2^4 \alpha_4 + c_{81} T_1^2 T_2^4 \alpha_4 - \alpha_4^2 + T_2 \alpha_4^2 + T_1 T_2 \alpha_4^2 - T_2^2 \alpha_4^2) \\
 & p_{2,j} p_{3,i} x_{2,j} x_{3,i} / ((-1 + T_1) (-1 + T_2) (-1 + T_1 T_2) (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) - \\
 & ((c_{81} + c_{86} - c_{22} T_1 + c_{56} T_1 + c_{69} T_1 + c_{15} T_2 + c_{36} T_2 + 3 T_1 T_2 - c_{15} T_1 T_2 + c_{22} T_1 T_2 - c_{56} T_1 T_2 - \\
 & 2 c_{81} T_1 T_2 - c_{86} T_1 T_2 - c_{56} T_1^2 T_2 - c_{69} T_1^2 T_2 - c_{15} T_1 T_2^2 - c_{36} T_1 T_2^2 - 3 T_1^2 T_2^2 + c_{15} T_1^2 T_2^2 + \\
 & c_{56} T_1^2 T_2^2 + c_{81} T_1^2 T_2^2 - \alpha_4) \alpha_4 p_{2,i} p_{3,j} x_{2,j} x_{3,i} / ((-1 + T_1) (c_{22} - c_{22} T_2 + T_2 \alpha_4)) - \\
 & ((-c_{22} c_{65} + c_{22} c_{65} T_1 + c_{22} c_{65} T_2 - c_{22} c_{65} T_1 T_2 - c_{22} c_{65} T_1 T_2^2 + c_{22} c_{65} T_1^2 T_2^2 - c_{81} \alpha_4 - \\
 & c_{86} \alpha_4 + c_{22} T_1 \alpha_4 - c_{56} T_1 \alpha_4 - c_{69} T_1 \alpha_4 - c_{15} T_2 \alpha_4 + c_{22} T_2 \alpha_4 - c_{36} T_2 \alpha_4 - c_{65} T_2 \alpha_4 + \\
 & c_{81} T_2 \alpha_4 + c_{86} T_2 \alpha_4 - 3 T_1 T_2 \alpha_4 + c_{15} T_1 T_2 \alpha_4 - 3 c_{22} T_1 T_2 \alpha_4 + 2 c_{56} T_1 T_2 \alpha_4 + \\
 & c_{65} T_1 T_2 \alpha_4 + c_{69} T_1 T_2 \alpha_4 + 2 c_{81} T_1 T_2 \alpha_4 + c_{86} T_1 T_2 \alpha_4 + c_{56} T_1^2 T_2 \alpha_4 + c_{69} T_1^2 T_2 \alpha_4 + \\
 & c_{15} T_2^2 \alpha_4 - c_{22} T_2^2 \alpha_4 + c_{36} T_2^2 \alpha_4 + 3 T_1 T_2^2 \alpha_4 + 2 c_{22} T_1 T_2^2 \alpha_4 + c_{36} T_1 T_2^2 \alpha_4 - c_{56} T_1 T_2^2 \alpha_4 + \\
 & c_{65} T_1 T_2^2 \alpha_4 - 2 c_{81} T_1 T_2^2 \alpha_4 - c_{86} T_1 T_2^2 \alpha_4 + 3 T_1^2 T_2^2 \alpha_4 - c_{15} T_1^2 T_2^2 \alpha_4 - 2 c_{56} T_1^2 T_2^2 \alpha_4 - \\
 & c_{65} T_1^2 T_2^2 \alpha_4 - c_{69} T_1^2 T_2^2 \alpha_4 - c_{81} T_1^2 T_2^2 \alpha_4 - c_{15} T_1 T_2^3 \alpha_4 - c_{36} T_1 T_2^3 \alpha_4 - 3 T_1^2 T_2^3 \alpha_4 + \\
 & c_{15} T_1^2 T_2^3 \alpha_4 + c_{56} T_1^2 T_2^3 \alpha_4 + c_{81} T_1^2 T_2^3 \alpha_4 + \alpha_4^2 - T_2 \alpha_4^2 + T_2^2 \alpha_4^2 - T_1 T_2 \alpha_4^2) p_{2,j} p_{3,j} x_{2,j} x_{3,i} / \\
 & ((-1 + T_1) (-1 + T_2) (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) + c_{78} p_{3,i} p_{3,j} x_{3,i}^2 - \\
 & ((-1 + T_1 T_2) (-2 c_{22} c_{78} + 2 c_{22} c_{78} T_1 + 2 c_{22} c_{78} T_2 + c_{22} T_1 T_2 + c_{22}^2 T_1 T_2 - 2 c_{22} c_{78} T_1 T_2 - \\
 & c_{22} c_{81} T_1 T_2 - c_{22} c_{86} T_1 T_2 - c_{22} T_1^2 T_2 - c_{22}^2 T_1^2 T_2 - c_{22} c_{56} T_1^2 T_2 - c_{22} c_{69} T_1^2 T_2 + c_{22} c_{81} T_1^2 T_2 + \\
 & c_{22} c_{86} T_1^2 T_2 + c_{22} c_{56} T_1^3 T_2 + c_{22} c_{69} T_1^3 T_2 - c_{22} T_1 T_2^2 - c_{15} c_{22} T_1 T_2^2 - c_{22}^2 T_1 T_2^2 - c_{22} c_{36} T_1 T_2^2 + \\
 & c_{22} c_{81} T_1 T_2^2 + c_{22} c_{86} T_1 T_2^2 - 2 c_{22} T_1^2 T_2^2 + 2 c_{15} c_{22} T_1^2 T_2^2 + c_{22}^2 T_1^2 T_2^2 + c_{22} c_{36} T_1^2 T_2^2 + \\
 & 2 c_{22} c_{56} T_1^2 T_2^2 + c_{22} c_{69} T_1^2 T_2^2 - c_{22} c_{86} T_1^2 T_2^2 + 3 c_{22} T_1^3 T_2^2 - c_{15} c_{22} T_1^3 T_2^2 - 2 c_{22} c_{56} T_1^3 T_2^2 - \\
 & c_{22} c_{69} T_1^3 T_2^2 - c_{22} c_{81} T_1^3 T_2^2 + c_{15} c_{22} T_1 T_2^3 + c_{22} c_{36} T_1 T_2^3 + 3 c_{22} T_1^2 T_2^3 - 2 c_{15} c_{22} T_1^2 T_2^3 -
 \end{aligned}$$

$$\begin{aligned}
 & c_{22} c_{36} T_1^2 T_2^3 - c_{22} c_{56} T_1^2 T_2^3 - c_{22} c_{81} T_1^2 T_2^3 - 3 c_{22} T_1^3 T_2^3 + c_{15} c_{22} T_1^3 T_2^3 + c_{22} c_{56} T_1^3 T_2^3 + \\
 & c_{22} c_{81} T_1^3 T_2^3 - 2 c_{78} T_2 \alpha_4 + 2 c_{78} T_1 T_2 \alpha_4 + c_{81} T_1 T_2 \alpha_4 + c_{86} T_1 T_2 \alpha_4 - c_{22} T_1^2 T_2 \alpha_4 + \\
 & c_{56} T_1^2 T_2 \alpha_4 + c_{69} T_1^2 T_2 \alpha_4 + T_1 T_2^2 \alpha_4 + c_{15} T_1 T_2^2 \alpha_4 + c_{22} T_1 T_2^2 \alpha_4 + c_{36} T_1 T_2^2 \alpha_4 - c_{81} T_1 T_2^2 \alpha_4 - \\
 & c_{86} T_1 T_2^2 \alpha_4 + 2 T_1^2 T_2^2 \alpha_4 - c_{15} T_1^2 T_2^2 \alpha_4 - 2 c_{56} T_1^2 T_2^2 \alpha_4 - c_{69} T_1^2 T_2^2 \alpha_4 - c_{81} T_1^2 T_2^2 \alpha_4 - \\
 & c_{15} T_1 T_2^3 \alpha_4 - c_{36} T_1 T_2^3 \alpha_4 - 3 T_1^2 T_2^3 \alpha_4 + c_{15} T_1^2 T_2^3 \alpha_4 + c_{56} T_1^2 T_2^3 \alpha_4 + c_{81} T_1^2 T_2^3 \alpha_4 - T_1 T_2 \alpha_4^2) \\
 & p_{3,j}^2 x_{3,i}^2 / (2 (-1 + T_1) (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) - \\
 & \frac{(-c_{56} T_1 - c_{69} T_1 - c_{15} T_2 - c_{36} T_2 - 3 T_1 T_2 + c_{15} T_1 T_2 + c_{56} T_1 T_2 + c_{81} T_1 T_2) p_{3,j} x_{3,j}}{T_1 T_2} + \\
 & ((-c_{13} c_{22} + c_{22} c_{32} + c_{13} c_{22} T_1 - c_{22} c_{81} T_1 - c_{22} c_{86} T_1 + c_{22}^2 T_1^2 - c_{22} c_{56} T_1^2 - c_{22} c_{69} T_1^2 + \\
 & c_{13} c_{22} T_2 - c_{22} c_{32} T_2 - c_{13} c_{22} T_1 T_2 - c_{15} c_{22} T_1 T_2 - c_{22} c_{32} T_1 T_2 - c_{22} c_{36} T_1 T_2 + \\
 & c_{22} c_{81} T_1 T_2 + c_{22} c_{86} T_1 T_2 - 3 c_{22} T_1^2 T_2 + c_{15} c_{22} T_1^2 T_2 - 2 c_{22}^2 T_1^2 T_2 + 2 c_{22} c_{56} T_1^2 T_2 + \\
 & c_{22} c_{69} T_1^2 T_2 + 2 c_{22} c_{81} T_1^2 T_2 + c_{22} c_{86} T_1^2 T_2 + c_{22} c_{56} T_1^3 T_2 + c_{22} c_{69} T_1^3 T_2 + c_{15} c_{22} T_1 T_2^2 + \\
 & c_{22} c_{32} T_1 T_2^2 + c_{22} c_{36} T_1 T_2^2 + 3 c_{22} T_1^2 T_2^2 + c_{22}^2 T_1^2 T_2^2 + c_{22} c_{36} T_1^2 T_2^2 - c_{22} c_{56} T_1^2 T_2^2 - \\
 & 2 c_{22} c_{81} T_1^2 T_2^2 - c_{22} c_{86} T_1^2 T_2^2 + 3 c_{22} T_1^3 T_2^2 - c_{15} c_{22} T_1^3 T_2^2 - 2 c_{22} c_{56} T_1^3 T_2^2 - c_{22} c_{69} T_1^3 T_2^2 - \\
 & c_{22} c_{81} T_1^3 T_2^2 - c_{15} c_{22} T_1^2 T_2^3 - c_{22} c_{36} T_1^2 T_2^3 - 3 c_{22} T_1^3 T_2^3 + c_{15} c_{22} T_1^3 T_2^3 + c_{22} c_{56} T_1^3 T_2^3 + \\
 & c_{22} c_{81} T_1^3 T_2^3 - c_{81} \alpha_4 - c_{86} \alpha_4 + 2 c_{22} T_1 \alpha_4 - c_{56} T_1 \alpha_4 - c_{69} T_1 \alpha_4 - c_{13} T_2 \alpha_4 - c_{15} T_2 \alpha_4 + \\
 & c_{32} T_2 \alpha_4 - c_{36} T_2 \alpha_4 - 3 T_1 T_2 \alpha_4 + c_{13} T_1 T_2 \alpha_4 + c_{15} T_1 T_2 \alpha_4 - 2 c_{22} T_1 T_2 \alpha_4 + \\
 & c_{56} T_1 T_2 \alpha_4 + 2 c_{81} T_1 T_2 \alpha_4 + c_{86} T_1 T_2 \alpha_4 + c_{56} T_1^2 T_2 \alpha_4 + c_{69} T_1^2 T_2 \alpha_4 + c_{15} T_1 T_2^2 \alpha_4 - \\
 & c_{32} T_1 T_2^2 \alpha_4 + c_{36} T_1 T_2^2 \alpha_4 + 3 T_1^2 T_2^2 \alpha_4 - c_{15} T_1^2 T_2^2 \alpha_4 - c_{56} T_1^2 T_2^2 \alpha_4 - c_{81} T_1^2 T_2^2 \alpha_4 + \alpha_4^2) \\
 & p_{1,i} p_{3,j} x_{1,i} x_{3,j} / ((-1 + T_1) (-1 + T_1 T_2) (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) - \\
 & \frac{(-c_{13} + c_{13} T_1 - c_{22} T_1 + c_{22} T_1^2 + T_1 \alpha_4) p_{1,j} p_{3,j} x_{1,i} x_{3,j}}{-1 + T_1 T_2} - \\
 & \frac{(-c_{22} - c_{54} + c_{65} + c_{22} T_2 + c_{54} T_2 - c_{65} T_1 T_2 - T_2 \alpha_4) p_{2,i} p_{3,j} x_{2,i} x_{3,j}}{(-1 + T_2) (-1 + T_1 T_2)} - \\
 & ((-1 + T_2) (c_{22} c_{54} - c_{22} c_{54} T_1 - c_{22} c_{54} T_2 - c_{22} c_{81} T_2 - c_{22} c_{86} T_2 + c_{22}^2 T_1 T_2 + \\
 & c_{22} c_{54} T_1 T_2 - c_{22} c_{56} T_1 T_2 - c_{22} c_{69} T_1 T_2 + c_{22} c_{81} T_1 T_2 + c_{22} c_{86} T_1 T_2 - c_{22}^2 T_1^2 T_2 + \\
 & c_{22} c_{56} T_1^2 T_2 + c_{22} c_{69} T_1^2 T_2 - c_{15} c_{22} T_2^2 - c_{22} c_{36} T_2^2 - 3 c_{22} T_1 T_2^2 + 2 c_{15} c_{22} T_1 T_2^2 - \\
 & c_{22}^2 T_1 T_2^2 + c_{22} c_{36} T_1 T_2^2 + c_{22} c_{56} T_1 T_2^2 + 2 c_{22} c_{81} T_1 T_2^2 + c_{22} c_{86} T_1 T_2^2 + 3 c_{22} T_1^2 T_2^2 - \\
 & c_{15} c_{22} T_1^2 T_2^2 + c_{22}^2 T_1^2 T_2^2 + c_{22} c_{69} T_1^2 T_2^2 - 2 c_{22} c_{81} T_1^2 T_2^2 - c_{22} c_{86} T_1^2 T_2^2 - c_{22} c_{56} T_1^3 T_2^2 - \\
 & c_{22} c_{69} T_1^3 T_2^2 + c_{15} c_{22} T_1 T_2^3 + c_{22} c_{36} T_1 T_2^3 + 3 c_{22} T_1^2 T_2^3 - 2 c_{15} c_{22} T_1^2 T_2^3 - c_{22} c_{36} T_1^2 T_2^3 - \\
 & c_{22} c_{56} T_1^2 T_2^3 - c_{22} c_{81} T_1^2 T_2^3 - 3 c_{22} T_1^3 T_2^3 + c_{15} c_{22} T_1^3 T_2^3 + c_{22} c_{56} T_1^3 T_2^3 + c_{22} c_{81} T_1^3 T_2^3 + \\
 & c_{22} T_2 \alpha_4 + c_{54} T_2 \alpha_4 + c_{81} T_2 \alpha_4 + c_{86} T_2 \alpha_4 - 2 c_{22} T_1 T_2 \alpha_4 - c_{54} T_1 T_2 \alpha_4 + c_{56} T_1 T_2 \alpha_4 + \\
 & c_{69} T_1 T_2 \alpha_4 + c_{15} T_2^2 \alpha_4 + c_{36} T_2^2 \alpha_4 + 3 T_1 T_2^2 \alpha_4 - c_{15} T_1 T_2^2 \alpha_4 + c_{22} T_1 T_2^2 \alpha_4 - \\
 & c_{56} T_1 T_2^2 \alpha_4 - 2 c_{81} T_1 T_2^2 \alpha_4 - c_{86} T_1 T_2^2 \alpha_4 - c_{56} T_1^2 T_2^2 \alpha_4 - c_{69} T_1^2 T_2^2 \alpha_4 - c_{15} T_1 T_2^3 \alpha_4 - \\
 & c_{36} T_1 T_2^3 \alpha_4 - 3 T_1^2 T_2^3 \alpha_4 + c_{15} T_1^2 T_2^3 \alpha_4 + c_{56} T_1^2 T_2^3 \alpha_4 + c_{81} T_1^2 T_2^3 \alpha_4 - T_2 \alpha_4^2) \\
 & p_{2,j} p_{3,j} x_{2,i} x_{3,j} / ((-1 + T_1) (-1 + T_1 T_2) (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) - \\
 & ((c_{22} + c_{22}^2 - c_{22} c_{81} - c_{22} c_{86} - c_{22} T_1 - c_{22}^2 T_1 - c_{22} c_{56} T_1 - c_{22} c_{69} T_1 + c_{22} c_{81} T_1 + c_{22} c_{86} T_1 + \\
 & c_{22} c_{56} T_1^2 + c_{22} c_{69} T_1^2 - c_{22} T_2 - c_{15} c_{22} T_2 - c_{22}^2 T_2 - c_{22} c_{36} T_2 + c_{22} c_{81} T_2 + c_{22} c_{86} T_2 - \\
 & 2 c_{22} T_1 T_2 + 2 c_{15} c_{22} T_1 T_2 + c_{22}^2 T_1 T_2 + c_{22} c_{36} T_1 T_2 + 2 c_{22} c_{56} T_1 T_2 + c_{22} c_{69} T_1 T_2 - \\
 & c_{22} c_{86} T_1 T_2 + 3 c_{22} T_1^2 T_2 - c_{15} c_{22} T_1^2 T_2 - 2 c_{22} c_{56} T_1^2 T_2 - c_{22} c_{69} T_1^2 T_2 - c_{22} c_{81} T_1^2 T_2 + \\
 & c_{15} c_{22} T_2^2 + c_{22} c_{36} T_2^2 + 3 c_{22} T_1 T_2^2 - 2 c_{15} c_{22} T_1 T_2^2 - c_{22} c_{36} T_1 T_2^2 - c_{22} c_{56} T_1 T_2^2 - \\
 & c_{22} c_{81} T_1 T_2^2 - 3 c_{22} T_1^2 T_2^2 + c_{15} c_{22} T_1^2 T_2^2 + c_{22} c_{56} T_1^2 T_2^2 + c_{22} c_{81} T_1^2 T_2^2 + c_{81} \alpha_4 + c_{86} \alpha_4 - \\
 & c_{22} T_1 \alpha_4 + c_{56} T_1 \alpha_4 + c_{69} T_1 \alpha_4 + T_2 \alpha_4 + c_{15} T_2 \alpha_4 + c_{22} T_2 \alpha_4 + c_{36} T_2 \alpha_4 - c_{81} T_2 \alpha_4 - \\
 & c_{86} T_2 \alpha_4 + 2 T_1 T_2 \alpha_4 - c_{15} T_1 T_2 \alpha_4 - 2 c_{56} T_1 T_2 \alpha_4 - c_{69} T_1 T_2 \alpha_4 - c_{81} T_1 T_2 \alpha_4 -
 \end{aligned}$$

$$\begin{aligned}
 & (c_{15} T_2^2 \alpha_4 - c_{36} T_2^2 \alpha_4 - 3 T_1 T_2^2 \alpha_4 + c_{15} T_1 T_2^2 \alpha_4 + c_{56} T_1 T_2^2 \alpha_4 + c_{81} T_1 T_2^2 \alpha_4 - \alpha_4^2) \\
 & p_{3,i} p_{3,j} x_{3,i} x_{3,j} / ((-1 + T_1) (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) + \\
 & ((c_{22} + c_{22}^2 - 2 c_{22} c_{78} - c_{22} c_{81} - c_{22} c_{86} - c_{22} T_1 - c_{22}^2 T_1 - c_{22} c_{56} T_1 - c_{22} c_{69} T_1 + 2 c_{22} c_{78} T_1 + \\
 & c_{22} c_{81} T_1 + c_{22} c_{86} T_1 + c_{22} c_{56} T_1^2 + c_{22} c_{69} T_1^2 - c_{22} T_2 - c_{15} c_{22} T_2 - c_{22}^2 T_2 - c_{22} c_{36} T_2 + \\
 & 2 c_{22} c_{78} T_2 + c_{22} c_{81} T_2 + c_{22} c_{86} T_2 - c_{22} T_1 T_2 + 2 c_{15} c_{22} T_1 T_2 + 2 c_{22}^2 T_1 T_2 + c_{22} c_{36} T_1 T_2 + \\
 & 2 c_{22} c_{56} T_1 T_2 + c_{22} c_{69} T_1 T_2 - 2 c_{22} c_{78} T_1 T_2 - c_{22} c_{81} T_1 T_2 - 2 c_{22} c_{86} T_1 T_2 + 2 c_{22} T_1^2 T_2 - \\
 & c_{15} c_{22} T_1^2 T_2 - c_{22}^2 T_1^2 T_2 - 3 c_{22} c_{56} T_1^2 T_2 - 2 c_{22} c_{69} T_1^2 T_2 + c_{22} c_{86} T_1^2 T_2 + c_{22} c_{56} T_1^3 T_2 + \\
 & c_{22} c_{69} T_1^3 T_2 + c_{15} c_{22} T_2^2 + c_{22} c_{36} T_2^2 + 2 c_{22} T_1 T_2^2 - 3 c_{15} c_{22} T_1 T_2^2 - c_{22}^2 T_1 T_2^2 - 2 c_{22} c_{36} T_1 T_2^2 - \\
 & c_{22} c_{56} T_1 T_2^2 + c_{22} c_{86} T_1 T_2^2 - 5 c_{22} T_1^2 T_2^2 + 3 c_{15} c_{22} T_1^2 T_2^2 + c_{22}^2 T_1^2 T_2^2 + c_{22} c_{36} T_1^2 T_2^2 + \\
 & 3 c_{22} c_{56} T_1^2 T_2^2 + c_{22} c_{69} T_1^2 T_2^2 + c_{22} c_{81} T_1^2 T_2^2 - c_{22} c_{86} T_1^2 T_2^2 + 3 c_{22} T_1^3 T_2^2 - c_{15} c_{22} T_1^3 T_2^2 - \\
 & 2 c_{22} c_{56} T_1^3 T_2^2 - c_{22} c_{69} T_1^3 T_2^2 - c_{22} c_{81} T_1^3 T_2^2 + c_{15} c_{22} T_1 T_2^3 + c_{22} c_{36} T_1 T_2^3 + 3 c_{22} T_1^2 T_2^3 - \\
 & 2 c_{15} c_{22} T_1^2 T_2^3 - c_{22} c_{36} T_1^2 T_2^3 - c_{22} c_{56} T_1^2 T_2^3 - c_{22} c_{81} T_1^2 T_2^3 - 3 c_{22} T_1^3 T_2^3 + c_{15} c_{22} T_1^3 T_2^3 + \\
 & c_{22} c_{56} T_1^3 T_2^3 + c_{22} c_{81} T_1^3 T_2^3 + c_{81} \alpha_4 + c_{86} \alpha_4 - c_{22} T_1 \alpha_4 + c_{56} T_1 \alpha_4 + c_{69} T_1 \alpha_4 + T_2 \alpha_4 + \\
 & c_{15} T_2 \alpha_4 + c_{22} T_2 \alpha_4 + c_{36} T_2 \alpha_4 - 2 c_{78} T_2 \alpha_4 - c_{81} T_2 \alpha_4 - c_{86} T_2 \alpha_4 + 2 T_1 T_2 \alpha_4 - c_{15} T_1 T_2 \alpha_4 - \\
 & 2 c_{56} T_1 T_2 \alpha_4 - c_{69} T_1 T_2 \alpha_4 + 2 c_{78} T_1 T_2 \alpha_4 + c_{86} T_1 T_2 \alpha_4 - c_{22} T_1^2 T_2 \alpha_4 + c_{56} T_1^2 T_2 \alpha_4 + \\
 & c_{69} T_1^2 T_2 \alpha_4 - c_{15} T_2^2 \alpha_4 - c_{36} T_2^2 \alpha_4 - 2 T_1 T_2^2 \alpha_4 + 2 c_{15} T_1 T_2^2 \alpha_4 + c_{22} T_1 T_2^2 \alpha_4 + c_{36} T_1 T_2^2 \alpha_4 + \\
 & c_{56} T_1 T_2^2 \alpha_4 - c_{86} T_1 T_2^2 \alpha_4 + 2 T_1^2 T_2^2 \alpha_4 - c_{15} T_1^2 T_2^2 \alpha_4 - 2 c_{56} T_1^2 T_2^2 \alpha_4 - c_{69} T_1^2 T_2^2 \alpha_4 - c_{81} T_1^2 T_2^2 \alpha_4 - \\
 & c_{15} T_1 T_2^3 \alpha_4 - c_{36} T_1 T_2^3 \alpha_4 - 3 T_1^2 T_2^3 \alpha_4 + c_{15} T_1^2 T_2^3 \alpha_4 + c_{56} T_1^2 T_2^3 \alpha_4 + c_{81} T_1^2 T_2^3 \alpha_4 - \alpha_4^2 - T_1 T_2 \alpha_4^2) \\
 & p_{3,j}^2 x_{3,i} x_{3,j} / (2 (-1 + T_1) (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) / \cdot \alpha_4 \rightarrow z \\
 r_1[-1, i_, j_] := & \frac{3}{2} - c_{15} p_{1,i} x_{1,i} + \frac{(-c_{15} - c_{36} + c_{15} T_1^2) p_{1,j} x_{1,i}}{T_1^2} + \\
 & \frac{(-1 - c_4 + T_1) p_{1,i} p_{1,j} x_{1,i}^2}{T_1} - \frac{(-1 + T_1) (-1 - 2 c_4 + 2 T_1) p_{1,j}^2 x_{1,i}^2}{2 T_1^2} + \\
 & \frac{(c_{15} + c_{36}) p_{1,j} x_{1,j}}{T_1} + p_{1,i} p_{1,j} x_{1,i} x_{1,j} - \frac{(-1 - 2 c_4 + 3 T_1) p_{1,j}^2 x_{1,i} x_{1,j}}{2 T_1} - \\
 & c_{56} p_{2,i} x_{2,i} - \frac{(c_{56} + c_{69} - c_{56} T_2^2) p_{2,j} x_{2,i}}{T_2^2} + \frac{1}{T_1 (-c_{22} + c_{22} T_2 - T_2 \alpha_4)} \\
 & ((c_{10} c_{22} + c_{22}^2 + c_{22} c_{28} - c_{22} c_{81} - c_{22} c_{86} - c_{10} c_{22} T_1 - c_{22}^2 T_1 - c_{22} c_{56} T_1 - c_{22} c_{69} T_1 + c_{22} c_{81} T_1 + \\
 & c_{22} c_{86} T_1 + c_{22} c_{56} T_1^2 + c_{22} c_{69} T_1^2 - c_{10} c_{22} T_2 - c_{15} c_{22} T_2 - c_{22}^2 T_2 - c_{22} c_{28} T_2 - c_{22} c_{36} T_2 + \\
 & c_{22} c_{81} T_2 + c_{22} c_{86} T_2 - 3 c_{22} T_1 T_2 + c_{10} c_{22} T_1 T_2 + 2 c_{15} c_{22} T_1 T_2 + c_{22}^2 T_1 T_2 + c_{22} c_{36} T_1 T_2 + \\
 & 2 c_{22} c_{56} T_1 T_2 + c_{22} c_{69} T_1 T_2 - c_{22} c_{86} T_1 T_2 + 3 c_{22} T_1^2 T_2 - c_{15} c_{22} T_1^2 T_2 - 2 c_{22} c_{56} T_1^2 T_2 - \\
 & c_{22} c_{69} T_1^2 T_2 - c_{22} c_{81} T_1^2 T_2 + c_{15} c_{22} T_2^2 + c_{22} c_{36} T_2^2 + 3 c_{22} T_1 T_2^2 - 2 c_{15} c_{22} T_1 T_2^2 - \\
 & c_{22} c_{36} T_1 T_2^2 - c_{22} c_{56} T_1 T_2^2 - c_{22} c_{81} T_1 T_2^2 - 3 c_{22} T_1^2 T_2^2 + c_{15} c_{22} T_1^2 T_2^2 + c_{22} c_{56} T_1^2 T_2^2 + \\
 & c_{22} c_{81} T_1^2 T_2^2 + c_{81} \alpha_4 + c_{86} \alpha_4 - c_{22} T_1 \alpha_4 + c_{56} T_1 \alpha_4 + c_{69} T_1 \alpha_4 + c_{10} T_2 \alpha_4 + c_{15} T_2 \alpha_4 + \\
 & c_{22} T_2 \alpha_4 + c_{28} T_2 \alpha_4 + c_{36} T_2 \alpha_4 - c_{81} T_2 \alpha_4 - c_{86} T_2 \alpha_4 + 3 T_1 T_2 \alpha_4 - c_{10} T_1 T_2 \alpha_4 - \\
 & c_{15} T_1 T_2 \alpha_4 - 2 c_{56} T_1 T_2 \alpha_4 - c_{69} T_1 T_2 \alpha_4 - c_{81} T_1 T_2 \alpha_4 - c_{15} T_2^2 \alpha_4 - c_{36} T_2^2 \alpha_4 - \\
 & 3 T_1 T_2^2 \alpha_4 + c_{15} T_1 T_2^2 \alpha_4 + c_{56} T_1 T_2^2 \alpha_4 + c_{81} T_1 T_2^2 \alpha_4 - \alpha_4^2) p_{1,j} p_{2,i} x_{1,i} x_{2,i} + \\
 & ((-c_{22} c_{28} + c_{22}^2 T_1 - c_{22} c_{81} T_1 - c_{22} c_{86} T_1 - c_{22} c_{56} T_1^2 - c_{22} c_{69} T_1^2 + 2 c_{22} c_{28} T_2 - c_{15} c_{22} T_1 T_2 - \\
 & 2 c_{22}^2 T_1 T_2 - c_{22} c_{36} T_1 T_2 + 2 c_{22} c_{81} T_1 T_2 + 2 c_{22} c_{86} T_1 T_2 - 3 c_{22} T_1^2 T_2 + c_{15} c_{22} T_1^2 T_2 + \\
 & 3 c_{22} c_{56} T_1^2 T_2 + 2 c_{22} c_{69} T_1^2 T_2 + c_{22} c_{81} T_1^2 T_2 - c_{22} c_{28} T_2^2 + 2 c_{15} c_{22} T_1 T_2^2 + c_{22}^2 T_1 T_2^2 + \\
 & 2 c_{22} c_{36} T_1 T_2^2 - c_{22} c_{81} T_1 T_2^2 - c_{22} c_{86} T_1 T_2^2 + 6 c_{22} T_1^2 T_2^2 - 2 c_{15} c_{22} T_1^2 T_2^2 - 3 c_{22} c_{56} T_1^2 T_2^2 - \\
 & c_{22} c_{69} T_1^2 T_2^2 - 2 c_{22} c_{81} T_1^2 T_2^2 - c_{15} c_{22} T_1 T_2^3 - c_{22} c_{36} T_1 T_2^3 - 3 c_{22} T_1^2 T_2^3 + c_{15} c_{22} T_1^2 T_2^3 + \\
 & c_{22} c_{56} T_1^2 T_2^3 + c_{22} c_{81} T_1^2 T_2^3 + c_{22} \alpha_4 - c_{81} \alpha_4 - c_{86} \alpha_4 + c_{22} T_1 \alpha_4 - c_{56} T_1 \alpha_4 - c_{69} T_1 \alpha_4 -
 \end{aligned}$$

$$\begin{aligned}
 & c_{15} T_2 \alpha_4 - c_{22} T_2 \alpha_4 - c_{28} T_2 \alpha_4 - c_{36} T_2 \alpha_4 + c_{81} T_2 \alpha_4 + c_{86} T_2 \alpha_4 - 3 T_1 T_2 \alpha_4 + \\
 & c_{15} T_1 T_2 \alpha_4 - c_{22} T_1 T_2 \alpha_4 + 2 c_{56} T_1 T_2 \alpha_4 + c_{69} T_1 T_2 \alpha_4 + c_{81} T_1 T_2 \alpha_4 + c_{15} T_2^2 \alpha_4 + \\
 & c_{28} T_2^2 \alpha_4 + c_{36} T_2^2 \alpha_4 + 3 T_1 T_2^2 \alpha_4 - c_{15} T_1 T_2^2 \alpha_4 - c_{56} T_1 T_2^2 \alpha_4 - c_{81} T_1 T_2^2 \alpha_4 + \alpha_4^2) \\
 & p_{1,i} p_{2,j} x_{1,i} x_{2,i} / ((-1 + T_1) T_2 (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) - \\
 & ((-c_{10} c_{22} - c_{22}^2 - 2 c_{22} c_{28} + c_{10} c_{22} T_1 + 2 c_{22}^2 T_1 - 2 c_{22} c_{81} T_1 - 2 c_{22} c_{86} T_1 - 2 c_{22} c_{56} T_1^2 - \\
 & 2 c_{22} c_{69} T_1^2 + 2 c_{10} c_{22} T_2 + 2 c_{22}^2 T_2 + 4 c_{22} c_{28} T_2 - c_{22} c_{81} T_2 - c_{22} c_{86} T_2 - 2 c_{10} c_{22} T_1 T_2 - \\
 & 2 c_{15} c_{22} T_1 T_2 - 4 c_{22}^2 T_1 T_2 - 2 c_{22} c_{36} T_1 T_2 - c_{22} c_{56} T_1 T_2 - c_{22} c_{69} T_1 T_2 + 4 c_{22} c_{81} T_1 T_2 + \\
 & 4 c_{22} c_{86} T_1 T_2 - 6 c_{22} T_1^2 T_2 + 2 c_{15} c_{22} T_1^2 T_2 + 6 c_{22} c_{56} T_1^2 T_2 + 4 c_{22} c_{69} T_1^2 T_2 + 2 c_{22} c_{81} T_1^2 T_2 - \\
 & c_{10} c_{22} T_2^2 - c_{15} c_{22} T_2^2 - c_{22}^2 T_2^2 - 2 c_{22} c_{28} T_2^2 - c_{22} c_{36} T_2^2 + c_{22} c_{81} T_2^2 + c_{22} c_{86} T_2^2 - \\
 & 3 c_{22} T_1 T_2^2 + c_{10} c_{22} T_1 T_2^2 + 5 c_{15} c_{22} T_1 T_2^2 + 2 c_{22}^2 T_1 T_2^2 + 4 c_{22} c_{36} T_1 T_2^2 + 2 c_{22} c_{56} T_1 T_2^2 + \\
 & c_{22} c_{69} T_1 T_2^2 - c_{22} c_{81} T_1 T_2^2 - 2 c_{22} c_{86} T_1 T_2^2 + 12 c_{22} T_1^2 T_2^2 - 4 c_{15} c_{22} T_1^2 T_2^2 - 6 c_{22} c_{56} T_1^2 T_2^2 - \\
 & 2 c_{22} c_{69} T_1^2 T_2^2 - 4 c_{22} c_{81} T_1^2 T_2^2 + c_{15} c_{22} T_2^3 + c_{22} c_{36} T_2^3 + 3 c_{22} T_1 T_2^3 - 3 c_{15} c_{22} T_1 T_2^3 - \\
 & 2 c_{22} c_{36} T_1 T_2^3 - c_{22} c_{56} T_1 T_2^3 - c_{22} c_{81} T_1 T_2^3 - 6 c_{22} T_1^2 T_2^3 + 2 c_{15} c_{22} T_1^2 T_2^3 + 2 c_{22} c_{56} T_1^2 T_2^3 + \\
 & 2 c_{22} c_{81} T_1^2 T_2^3 + c_{22} \alpha_4 - 2 c_{81} \alpha_4 - 2 c_{86} \alpha_4 + 2 c_{22} T_1 \alpha_4 - 2 c_{56} T_1 \alpha_4 - 2 c_{69} T_1 \alpha_4 - c_{10} T_2 \alpha_4 - \\
 & 2 c_{15} T_2 \alpha_4 - 2 c_{22} T_2 \alpha_4 - 2 c_{28} T_2 \alpha_4 - 2 c_{36} T_2 \alpha_4 + 2 c_{81} T_2 \alpha_4 + 2 c_{86} T_2 \alpha_4 - 6 T_1 T_2 \alpha_4 + \\
 & c_{10} T_1 T_2 \alpha_4 + 2 c_{15} T_1 T_2 \alpha_4 - 2 c_{22} T_1 T_2 \alpha_4 + 4 c_{56} T_1 T_2 \alpha_4 + 2 c_{69} T_1 T_2 \alpha_4 + 2 c_{81} T_1 T_2 \alpha_4 + \\
 & c_{10} T_2^2 \alpha_4 + 2 c_{15} T_2^2 \alpha_4 + c_{22} T_2^2 \alpha_4 + 2 c_{28} T_2^2 \alpha_4 + 2 c_{36} T_2^2 \alpha_4 - c_{81} T_2^2 \alpha_4 - c_{86} T_2^2 \alpha_4 + \\
 & 6 T_1 T_2^2 \alpha_4 - c_{10} T_1 T_2^2 \alpha_4 - 2 c_{15} T_1 T_2^2 \alpha_4 - 3 c_{56} T_1 T_2^2 \alpha_4 - c_{69} T_1 T_2^2 \alpha_4 - 2 c_{81} T_1 T_2^2 \alpha_4 - \\
 & c_{15} T_2^3 \alpha_4 - c_{36} T_2^3 \alpha_4 - 3 T_1 T_2^3 \alpha_4 + c_{15} T_1 T_2^3 \alpha_4 + c_{56} T_1 T_2^3 \alpha_4 + c_{81} T_1 T_2^3 \alpha_4 + 2 \alpha_4^2 - T_2 \alpha_4^2) \\
 & p_{1,j} p_{2,j} x_{1,i} x_{2,i} / (T_1 T_2 (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) + \\
 & ((c_{10} c_{22} + c_{22}^2 - c_{22} c_{81} - c_{22} c_{86} - c_{10} c_{22} T_1 - c_{22}^2 T_1 - c_{22} c_{56} T_1 - c_{22} c_{69} T_1 + c_{22} c_{81} T_1 + \\
 & c_{22} c_{86} T_1 + c_{22} c_{56} T_1^2 + c_{22} c_{69} T_1^2 - c_{10} c_{22} T_2 - c_{15} c_{22} T_2 - c_{22}^2 T_2 - c_{22} c_{36} T_2 + c_{22} c_{81} T_2 + \\
 & c_{22} c_{86} T_2 - 3 c_{22} T_1 T_2 + c_{10} c_{22} T_1 T_2 + 2 c_{15} c_{22} T_1 T_2 + c_{22}^2 T_1 T_2 + c_{22} c_{36} T_1 T_2 + \\
 & 2 c_{22} c_{56} T_1 T_2 + c_{22} c_{69} T_1 T_2 - c_{22} c_{86} T_1 T_2 + 3 c_{22} T_1^2 T_2 - c_{15} c_{22} T_1^2 T_2 - 2 c_{22} c_{56} T_1^2 T_2 - \\
 & c_{22} c_{69} T_1^2 T_2 - c_{22} c_{81} T_1^2 T_2 + c_{15} c_{22} T_2^2 + c_{22} c_{36} T_2^2 + 3 c_{22} T_1 T_2^2 - 2 c_{15} c_{22} T_1 T_2^2 - c_{22} c_{36} T_1 T_2^2 - \\
 & c_{22} c_{56} T_1 T_2^2 - c_{22} c_{81} T_1 T_2^2 - 3 c_{22} T_1^2 T_2^2 + c_{15} c_{22} T_1^2 T_2^2 + c_{22} c_{56} T_1^2 T_2^2 + c_{22} c_{81} T_1^2 T_2^2 + c_{81} \alpha_4 + \\
 & c_{86} \alpha_4 - c_{22} T_1 \alpha_4 + c_{56} T_1 \alpha_4 + c_{69} T_1 \alpha_4 + c_{10} T_2 \alpha_4 + c_{15} T_2 \alpha_4 + c_{22} T_2 \alpha_4 + c_{36} T_2 \alpha_4 - \\
 & c_{81} T_2 \alpha_4 - c_{86} T_2 \alpha_4 + 3 T_1 T_2 \alpha_4 - c_{10} T_1 T_2 \alpha_4 - c_{15} T_1 T_2 \alpha_4 - 2 c_{56} T_1 T_2 \alpha_4 - c_{69} T_1 T_2 \alpha_4 - \\
 & c_{81} T_1 T_2 \alpha_4 - c_{15} T_2^2 \alpha_4 - c_{36} T_2^2 \alpha_4 - 3 T_1 T_2^2 \alpha_4 + c_{15} T_1 T_2^2 \alpha_4 + c_{56} T_1 T_2^2 \alpha_4 + c_{81} T_1 T_2^2 \alpha_4 - \alpha_4^2) \\
 & p_{1,j} p_{2,i} x_{1,j} x_{2,i} / ((-1 + T_1) (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) - \\
 & ((-1 + T_2) (c_{10} c_{22} + c_{22}^2 + c_{22} c_{28} - c_{10} c_{22} T_1 - 2 c_{22}^2 T_1 + c_{22} c_{81} T_1 + c_{22} c_{86} T_1 + c_{22} c_{56} T_1^2 + \\
 & c_{22} c_{69} T_1^2 - c_{10} c_{22} T_2 - c_{22}^2 T_2 - c_{22} c_{28} T_2 + c_{22} c_{81} T_2 + c_{22} c_{86} T_2 + c_{10} c_{22} T_1 T_2 + c_{15} c_{22} T_1 T_2 + \\
 & 2 c_{22}^2 T_1 T_2 + c_{22} c_{36} T_1 T_2 + c_{22} c_{56} T_1 T_2 + c_{22} c_{69} T_1 T_2 - 2 c_{22} c_{81} T_1 T_2 - 2 c_{22} c_{86} T_1 T_2 + \\
 & 3 c_{22} T_1^2 T_2 - c_{15} c_{22} T_1^2 T_2 - 3 c_{22} c_{56} T_1^2 T_2 - 2 c_{22} c_{69} T_1^2 T_2 - c_{22} c_{81} T_1^2 T_2 + c_{15} c_{22} T_2^2 + \\
 & c_{22} c_{36} T_2^2 + 3 c_{22} T_1 T_2^2 - 3 c_{15} c_{22} T_1 T_2^2 - 2 c_{22} c_{36} T_1 T_2^2 - c_{22} c_{56} T_1 T_2^2 - c_{22} c_{81} T_1 T_2^2 - \\
 & 6 c_{22} T_1^2 T_2^2 + 2 c_{15} c_{22} T_1^2 T_2^2 + 2 c_{22} c_{56} T_1^2 T_2^2 + 2 c_{22} c_{81} T_1^2 T_2^2 - c_{22} \alpha_4 + c_{81} \alpha_4 + c_{86} \alpha_4 - \\
 & c_{22} T_1 \alpha_4 + c_{56} T_1 \alpha_4 + c_{69} T_1 \alpha_4 + c_{10} T_2 \alpha_4 + c_{15} T_2 \alpha_4 + c_{22} T_2 \alpha_4 + c_{28} T_2 \alpha_4 + c_{36} T_2 \alpha_4 - \\
 & c_{81} T_2 \alpha_4 - c_{86} T_2 \alpha_4 + 3 T_1 T_2 \alpha_4 - c_{10} T_1 T_2 \alpha_4 - c_{15} T_1 T_2 \alpha_4 - 2 c_{56} T_1 T_2 \alpha_4 - c_{69} T_1 T_2 \alpha_4 - \\
 & c_{81} T_1 T_2 \alpha_4 - c_{15} T_2^2 \alpha_4 - c_{36} T_2^2 \alpha_4 - 3 T_1 T_2^2 \alpha_4 + c_{15} T_1 T_2^2 \alpha_4 + c_{56} T_1 T_2^2 \alpha_4 + c_{81} T_1 T_2^2 \alpha_4 - \alpha_4^2) \\
 & p_{1,j} p_{2,j} x_{1,j} x_{2,i} / ((-1 + T_1) T_2 (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) + \\
 & \frac{(-1 - c_{49} + T_2) p_{2,i} p_{2,j} x_{2,i}^2}{T_2} - \frac{(-1 + T_2) (-1 - 2 c_{49} + 2 T_2) p_{2,j}^2 x_{2,i}^2}{2 T_2^2} + \\
 & \frac{(c_{56} + c_{69}) p_{2,j} x_{2,j}}{T_2} -
 \end{aligned}$$

$$\begin{aligned}
 & \frac{c_{10} p_{1,i} p_{2,j} x_{1,i} x_{2,j} - 1}{T_1 (-c_{22} + c_{22} T_2 - T_2 \alpha_4)} \\
 & \left(c_{22} c_{28} - c_{22}^2 T_1 + c_{22} c_{81} T_1 + c_{22} c_{86} T_1 + c_{22} c_{56} T_1^2 + c_{22} c_{69} T_1^2 - c_{22} c_{28} T_2 + \right. \\
 & \quad c_{15} c_{22} T_1 T_2 + c_{22}^2 T_1 T_2 + c_{22} c_{36} T_1 T_2 - c_{22} c_{81} T_1 T_2 - c_{22} c_{86} T_1 T_2 + 3 c_{22} T_1^2 T_2 - \\
 & \quad c_{15} c_{22} T_1^2 T_2 - 2 c_{22} c_{56} T_1^2 T_2 - c_{22} c_{69} T_1^2 T_2 - c_{22} c_{81} T_1^2 T_2 - c_{15} c_{22} T_1 T_2^2 - \\
 & \quad c_{22} c_{36} T_1 T_2^2 - 3 c_{22} T_1^2 T_2^2 + c_{15} c_{22} T_1^2 T_2^2 + c_{22} c_{56} T_1^2 T_2^2 + c_{22} c_{81} T_1^2 T_2^2 + c_{81} \alpha_4 + \\
 & \quad c_{86} \alpha_4 - c_{22} T_1 \alpha_4 + c_{56} T_1 \alpha_4 + c_{69} T_1 \alpha_4 + c_{15} T_2 \alpha_4 + c_{28} T_2 \alpha_4 + c_{36} T_2 \alpha_4 + \\
 & \quad \left. 3 T_1 T_2 \alpha_4 - c_{15} T_1 T_2 \alpha_4 - c_{56} T_1 T_2 \alpha_4 - c_{81} T_1 T_2 \alpha_4 - \alpha_4^2 \right) p_{1,j} p_{2,j} x_{1,i} x_{2,j} + \\
 & \quad \frac{(-1 - 2 c_{49} + 3 T_2) p_{2,j}^2 x_{2,i} x_{2,j}}{2 T_2} - \frac{1}{B T_1 (c_{22} - c_{22} T_2 + T_2 \alpha_4)} \\
 & p_{2,i} p_{2,j} x_{2,i} x_{2,j} - \frac{1}{2 T_2} \\
 & \left(c_{81} + c_{86} - c_{22} T_1 + c_{56} T_1 + c_{69} T_1 + c_{15} T_2 + c_{36} T_2 + 3 T_1 T_2 - c_{15} T_1 T_2 + c_{22} T_1 T_2 - \right. \\
 & \quad c_{56} T_1 T_2 - 2 c_{81} T_1 T_2 - c_{86} T_1 T_2 - c_{56} T_1^2 T_2 - c_{69} T_1^2 T_2 - c_{15} T_1 T_2^2 - c_{36} T_1 T_2^2 - \\
 & \quad \left. 3 T_1^2 T_2^2 + c_{15} T_1^2 T_2^2 + c_{56} T_1^2 T_2^2 + c_{81} T_1^2 T_2^2 - \alpha_4 \right) \alpha_4 p_{1,j} p_{2,i} x_{3,i} - \frac{\alpha_4 p_{1,i} p_{2,j} x_{3,i}}{B T_2} + \\
 & \left(\alpha_4 \left(c_{22} T_1 + c_{81} T_2 + c_{86} T_2 - 2 c_{22} T_1 T_2 + c_{56} T_1 T_2 + c_{69} T_1 T_2 + c_{15} T_2^2 + c_{36} T_2^2 + 3 T_1 T_2^2 - \right. \right. \\
 & \quad c_{15} T_1 T_2^2 + c_{22} T_1 T_2^2 - c_{56} T_1 T_2^2 - 2 c_{81} T_1 T_2^2 - c_{86} T_1 T_2^2 - c_{56} T_1^2 T_2^2 - c_{69} T_1^2 T_2^2 - \\
 & \quad \left. c_{15} T_1 T_2^3 - c_{36} T_1 T_2^3 - 3 T_1^2 T_2^3 + c_{15} T_1^2 T_2^3 + c_{56} T_1^2 T_2^3 + c_{81} T_1^2 T_2^3 - T_2 \alpha_4 + T_1 T_2 \alpha_4 \right) \\
 & \quad \left. p_{1,j} p_{2,j} x_{3,i} \right) / (B T_1 T_2 (c_{22} - c_{22} T_2 + T_2 \alpha_4)) - c_{81} p_{3,i} x_{3,i} + \\
 & \left((-c_{22} c_{56} T_1 - c_{22} c_{69} T_1 - c_{15} c_{22} T_2 - c_{22} c_{36} T_2 - 3 c_{22} T_1 T_2 + c_{15} c_{22} T_1 T_2 + 2 c_{22} c_{56} T_1 T_2 + \right. \\
 & \quad c_{22} c_{69} T_1 T_2 + c_{22} c_{81} T_1 T_2 + c_{22}^2 T_1^2 T_2 + c_{15} c_{22} T_2^2 + c_{22} c_{36} T_2^2 + 3 c_{22} T_1 T_2^2 - c_{15} c_{22} T_1 T_2^2 - \\
 & \quad c_{22} c_{56} T_1 T_2^2 - c_{22} c_{81} T_1 T_2^2 - 2 c_{22}^2 T_1^2 T_2^2 + c_{22} c_{86} T_1^2 T_2^2 + c_{22} c_{56} T_1^3 T_2^2 + c_{22} c_{69} T_1^3 T_2^2 + \\
 & \quad c_{15} c_{22} T_1^2 T_2^3 + c_{22}^2 T_1^2 T_2^3 + c_{22} c_{36} T_1^2 T_2^3 - c_{22} c_{86} T_1^2 T_2^3 + 3 c_{22} T_1^3 T_2^3 - c_{15} c_{22} T_1^3 T_2^3 - \\
 & \quad 2 c_{22} c_{56} T_1^3 T_2^3 - c_{22} c_{69} T_1^3 T_2^3 - c_{22} c_{81} T_1^3 T_2^3 - c_{15} c_{22} T_1^2 T_2^4 - c_{22} c_{36} T_1^2 T_2^4 - 3 c_{22} T_1^3 T_2^4 + \\
 & \quad c_{15} c_{22} T_1^3 T_2^4 + c_{22} c_{56} T_1^3 T_2^4 + c_{22} c_{81} T_1^3 T_2^4 - c_{56} T_1 T_2 \alpha_4 - c_{69} T_1 T_2 \alpha_4 - c_{15} T_2^2 \alpha_4 - c_{36} T_2^2 \alpha_4 - \\
 & \quad 3 T_1 T_2^2 \alpha_4 + c_{15} T_1 T_2^2 \alpha_4 + c_{56} T_1 T_2^2 \alpha_4 + 2 c_{81} T_1 T_2^2 \alpha_4 + c_{86} T_1 T_2^2 \alpha_4 + c_{56} T_1^2 T_2^2 \alpha_4 + c_{69} T_1^2 T_2^2 \alpha_4 + \\
 & \quad \left. c_{15} T_1 T_2^3 \alpha_4 + c_{36} T_1 T_2^3 \alpha_4 + 3 T_1^2 T_2^3 \alpha_4 - c_{15} T_1^2 T_2^3 \alpha_4 - c_{56} T_1^2 T_2^3 \alpha_4 - 2 c_{81} T_1^2 T_2^3 \alpha_4 - T_1 T_2^2 \alpha_4^2 \right) \\
 & \quad \left. p_{3,j} x_{3,i} \right) / (T_1^2 T_2^2 (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) - \frac{1}{T_1 (-1 + T_1 T_2)} \\
 & \left(-c_{13} + c_{22} - c_{81} - c_{86} + c_{13} T_1 - c_{22} T_1 - c_{56} T_1 - c_{69} T_1 + c_{22} T_1^2 - c_{15} T_2 - c_{36} T_2 - 3 T_1 T_2 + \right. \\
 & \quad c_{15} T_1 T_2 - c_{22} T_1 T_2 + c_{56} T_1 T_2 + 2 c_{81} T_1 T_2 + c_{86} T_1 T_2 + c_{56} T_1^2 T_2 + c_{69} T_1^2 T_2 + c_{15} T_1 T_2^2 + \\
 & \quad \left. c_{36} T_1 T_2^2 + 3 T_1^2 T_2^2 - c_{15} T_1^2 T_2^2 - c_{56} T_1^2 T_2^2 - c_{81} T_1^2 T_2^2 + T_1 \alpha_4 \right) p_{1,j} p_{3,i} x_{1,i} x_{3,i} - \\
 & \left((-c_{22}^2 + c_{22} c_{32} + 2 c_{22}^2 T_1 - c_{22} c_{81} T_1 - c_{22} c_{86} T_1 - c_{22} c_{56} T_1^2 - c_{22} c_{69} T_1^2 + c_{22}^2 T_2 - \right. \\
 & \quad c_{22} c_{32} T_2 - c_{15} c_{22} T_1 T_2 - 2 c_{22}^2 T_1 T_2 - c_{22} c_{32} T_1 T_2 - c_{22} c_{36} T_1 T_2 + c_{22} c_{81} T_1 T_2 + \\
 & \quad c_{22} c_{86} T_1 T_2 - 3 c_{22} T_1^2 T_2 + c_{15} c_{22} T_1^2 T_2 - c_{22}^2 T_1^2 T_2 + 2 c_{22} c_{56} T_1^2 T_2 + c_{22} c_{69} T_1^2 T_2 + \\
 & \quad 2 c_{22} c_{81} T_1^2 T_2 + c_{22} c_{86} T_1^2 T_2 + c_{22} c_{56} T_1^3 T_2 + c_{22} c_{69} T_1^3 T_2 + c_{15} c_{22} T_1 T_2^2 + c_{22} c_{32} T_1 T_2^2 + \\
 & \quad c_{22} c_{36} T_1 T_2^2 + 3 c_{22} T_1^2 T_2^2 + c_{22}^2 T_1^2 T_2^2 + c_{22} c_{36} T_1^2 T_2^2 - c_{22} c_{56} T_1^2 T_2^2 - 2 c_{22} c_{81} T_1^2 T_2^2 - \\
 & \quad c_{22} c_{86} T_1^2 T_2^2 + 3 c_{22} T_1^3 T_2^2 - c_{15} c_{22} T_1^3 T_2^2 - 2 c_{22} c_{56} T_1^3 T_2^2 - c_{22} c_{69} T_1^3 T_2^2 - c_{22} c_{81} T_1^3 T_2^2 - \\
 & \quad c_{15} c_{22} T_1^2 T_2^3 - c_{22} c_{36} T_1^2 T_2^3 - 3 c_{22} T_1^3 T_2^3 + c_{15} c_{22} T_1^3 T_2^3 + c_{22} c_{56} T_1^3 T_2^3 + c_{22} c_{81} T_1^3 T_2^3 + \\
 & \quad c_{22} \alpha_4 - c_{81} \alpha_4 - c_{86} \alpha_4 + c_{22} T_1 \alpha_4 - c_{56} T_1 \alpha_4 - c_{69} T_1 \alpha_4 - c_{15} T_2 \alpha_4 - 2 c_{22} T_2 \alpha_4 + \\
 & \quad c_{32} T_2 \alpha_4 - c_{36} T_2 \alpha_4 - 3 T_1 T_2 \alpha_4 + c_{15} T_1 T_2 \alpha_4 + c_{22} T_1 T_2 \alpha_4 + c_{56} T_1 T_2 \alpha_4 + 2 c_{81} T_1 T_2 \alpha_4 + \\
 & \quad c_{86} T_1 T_2 \alpha_4 - c_{22} T_1^2 T_2 \alpha_4 + c_{56} T_1^2 T_2 \alpha_4 + c_{69} T_1^2 T_2 \alpha_4 + c_{15} T_1 T_2^2 \alpha_4 - c_{32} T_1 T_2^2 \alpha_4 + \\
 & \quad \left. c_{36} T_1 T_2^2 \alpha_4 + 3 T_1^2 T_2^2 \alpha_4 - c_{15} T_1^2 T_2^2 \alpha_4 - c_{56} T_1^2 T_2^2 \alpha_4 - c_{81} T_1^2 T_2^2 \alpha_4 + \alpha_4^2 + T_2 \alpha_4^2 - T_1 T_2 \alpha_4^2 \right)
 \end{aligned}$$

$$\begin{aligned}
 & p_{1,i} p_{3,j} x_{1,i} x_{3,i} / ((-1 + T_1) T_1 T_2 (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) + \\
 & ((c_{13} c_{22} - c_{22}^2 + c_{22} c_{32} - c_{13} c_{22} T_1 + 3 c_{22}^2 T_1 - c_{22} c_{81} T_1 - c_{22} c_{86} T_1 - c_{22}^2 T_1^2 - c_{22} c_{56} T_1^2 - \\
 & c_{22} c_{69} T_1^2 - c_{13} c_{22} T_2 + c_{22}^2 T_2 - c_{22} c_{32} T_2 + c_{13} c_{22} T_1 T_2 - c_{15} c_{22} T_1 T_2 - 3 c_{22}^2 T_1 T_2 - \\
 & c_{22} c_{32} T_1 T_2 - c_{22} c_{36} T_1 T_2 + c_{22} c_{81} T_1 T_2 + c_{22} c_{86} T_1 T_2 - 3 c_{22} T_1^2 T_2 + c_{15} c_{22} T_1^2 T_2 + \\
 & 2 c_{22} c_{56} T_1^2 T_2 + c_{22} c_{69} T_1^2 T_2 + 2 c_{22} c_{81} T_1^2 T_2 + c_{22} c_{86} T_1^2 T_2 + c_{22} c_{56} T_1^3 T_2 + c_{22} c_{69} T_1^3 T_2 + \\
 & c_{15} c_{22} T_1 T_2^2 + c_{22} c_{32} T_1 T_2^2 + c_{22} c_{36} T_1 T_2^2 + 3 c_{22} T_1^2 T_2^2 + c_{22}^2 T_1^2 T_2^2 + c_{22} c_{36} T_1^2 T_2^2 - \\
 & c_{22} c_{56} T_1^2 T_2^2 - 2 c_{22} c_{81} T_1^2 T_2^2 - c_{22} c_{86} T_1^2 T_2^2 + 3 c_{22} T_1^3 T_2^2 - c_{15} c_{22} T_1^3 T_2^2 - 2 c_{22} c_{56} T_1^3 T_2^2 - \\
 & c_{22} c_{69} T_1^3 T_2^2 - c_{22} c_{81} T_1^3 T_2^2 - c_{15} c_{22} T_1^2 T_2^3 - c_{22} c_{36} T_1^2 T_2^3 - 3 c_{22} T_1^3 T_2^3 + c_{15} c_{22} T_1^3 T_2^3 + \\
 & c_{22} c_{56} T_1^3 T_2^3 + c_{22} c_{81} T_1^3 T_2^3 + c_{22} \alpha_4 - c_{81} \alpha_4 - c_{86} \alpha_4 - c_{56} T_1 \alpha_4 - c_{69} T_1 \alpha_4 + c_{13} T_2 \alpha_4 - \\
 & c_{15} T_2 \alpha_4 - 2 c_{22} T_2 \alpha_4 + c_{32} T_2 \alpha_4 - c_{36} T_2 \alpha_4 - 3 T_1 T_2 \alpha_4 - c_{13} T_1 T_2 \alpha_4 + c_{15} T_1 T_2 \alpha_4 + \\
 & 3 c_{22} T_1 T_2 \alpha_4 + c_{56} T_1 T_2 \alpha_4 + 2 c_{81} T_1 T_2 \alpha_4 + c_{86} T_1 T_2 \alpha_4 - 2 c_{22} T_1^2 T_2 \alpha_4 + c_{56} T_1^2 T_2 \alpha_4 + \\
 & c_{69} T_1^2 T_2 \alpha_4 + c_{15} T_1 T_2^2 \alpha_4 - c_{32} T_1 T_2^2 \alpha_4 + c_{36} T_1 T_2^2 \alpha_4 + 3 T_1^2 T_2^2 \alpha_4 - c_{15} T_1^2 T_2^2 \alpha_4 - c_{56} T_1^2 T_2^2 \alpha_4 - \\
 & c_{81} T_1^2 T_2^2 \alpha_4 + \alpha_4^2 + T_2 \alpha_4^2 - 2 T_1 T_2 \alpha_4^2) p_{1,j} p_{3,j} x_{1,i} x_{3,i} / (T_1^2 T_2 (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) - \\
 & \frac{1}{(-1 + T_1) (-1 + T_1 T_2)} (-c_{13} + c_{22} + c_{32} - c_{81} - c_{86} + c_{13} T_1 - c_{22} T_1 - c_{56} T_1 - c_{69} T_1 + \\
 & c_{22} T_1^2 - c_{15} T_2 - c_{36} T_2 - 3 T_1 T_2 + c_{15} T_1 T_2 - c_{22} T_1 T_2 - c_{32} T_1 T_2 + c_{56} T_1 T_2 + \\
 & 2 c_{81} T_1 T_2 + c_{86} T_1 T_2 + c_{56} T_1^2 T_2 + c_{69} T_1^2 T_2 + c_{15} T_1 T_2^2 + c_{36} T_1 T_2^2 + 3 T_1^2 T_2^2 - \\
 & c_{15} T_1^2 T_2^2 - c_{56} T_1^2 T_2^2 - c_{81} T_1^2 T_2^2 + T_1 \alpha_4) p_{1,j} p_{3,j} x_{1,i} x_{3,i} - \frac{c_{22} p_{1,i} p_{3,j} x_{1,j} x_{3,i}}{T_2} + \\
 & ((c_{13} c_{22} - c_{22}^2 - c_{13} c_{22} T_1 + 3 c_{22}^2 T_1 - 2 c_{22}^2 T_1^2 - c_{13} c_{22} T_2 + c_{22}^2 T_2 + c_{13} c_{22} T_1 T_2 - 3 c_{22}^2 T_1 T_2 + \\
 & 2 c_{22}^2 T_1^2 T_2 + c_{22} \alpha_4 - c_{22} T_1 \alpha_4 + c_{13} T_2 \alpha_4 - 2 c_{22} T_2 \alpha_4 + c_{81} T_2 \alpha_4 + c_{86} T_2 \alpha_4 - c_{13} T_1 T_2 \alpha_4 + \\
 & 3 c_{22} T_1 T_2 \alpha_4 + c_{56} T_1 T_2 \alpha_4 + c_{69} T_1 T_2 \alpha_4 - 2 c_{22} T_1^2 T_2 \alpha_4 + c_{15} T_2^2 \alpha_4 + c_{36} T_2^2 \alpha_4 + 3 T_1 T_2^2 \alpha_4 - \\
 & c_{15} T_1 T_2^2 \alpha_4 + c_{22} T_1 T_2^2 \alpha_4 - c_{56} T_1 T_2^2 \alpha_4 - 2 c_{81} T_1 T_2^2 \alpha_4 - c_{86} T_1 T_2^2 \alpha_4 - c_{56} T_1^2 T_2^2 \alpha_4 - c_{69} T_1^2 T_2^2 \\
 & \alpha_4 - c_{15} T_1 T_2^3 \alpha_4 - c_{36} T_1 T_2^3 \alpha_4 - 3 T_1^2 T_2^3 \alpha_4 + c_{15} T_1^2 T_2^3 \alpha_4 + c_{56} T_1^2 T_2^3 \alpha_4 + c_{81} T_1^2 T_2^3 \alpha_4 - T_1 T_2 \alpha_4^2) \\
 & p_{1,j} p_{3,j} x_{1,j} x_{3,i} / ((-1 + T_1) T_1 T_2 (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) - \\
 & ((-c_{22} c_{54} - c_{22} c_{81} - c_{22} c_{86} + c_{22} c_{54} T_1 - c_{22} c_{56} T_1 - c_{22} c_{69} T_1 + c_{22} c_{81} T_1 + c_{22} c_{86} T_1 + \\
 & c_{22} c_{56} T_1^2 + c_{22} c_{69} T_1^2 - c_{15} c_{22} T_2 - c_{22} c_{36} T_2 + 2 c_{22} c_{54} T_2 + 2 c_{22} c_{81} T_2 + 2 c_{22} c_{86} T_2 - \\
 & 3 c_{22} T_1 T_2 + 2 c_{15} c_{22} T_1 T_2 - c_{22}^2 T_1 T_2 + c_{22} c_{36} T_1 T_2 - 2 c_{22} c_{54} T_1 T_2 + 3 c_{22} c_{56} T_1 T_2 + \\
 & 2 c_{22} c_{69} T_1 T_2 - c_{22} c_{86} T_1 T_2 + 3 c_{22} T_1^2 T_2 - c_{15} c_{22} T_1^2 T_2 + c_{22}^2 T_1^2 T_2 - 2 c_{22} c_{56} T_1^2 T_2 - \\
 & c_{22} c_{69} T_1^2 T_2 - 2 c_{22} c_{81} T_1^2 T_2 - c_{22} c_{86} T_1^2 T_2 - c_{22} c_{56} T_1^3 T_2 - c_{22} c_{69} T_1^3 T_2 + 2 c_{15} c_{22} T_2^2 + \\
 & 2 c_{22} c_{36} T_2^2 - c_{22} c_{54} T_2^2 - c_{22} c_{81} T_2^2 - c_{22} c_{86} T_2^2 + 6 c_{22} T_1 T_2^2 - 3 c_{15} c_{22} T_1 T_2^2 + 2 c_{22}^2 T_1 T_2^2 - \\
 & c_{22} c_{36} T_1 T_2^2 + c_{22} c_{54} T_1 T_2^2 - 3 c_{22} c_{56} T_1 T_2^2 - c_{22} c_{69} T_1 T_2^2 - 3 c_{22} c_{81} T_1 T_2^2 - c_{22} c_{86} T_1 T_2^2 - \\
 & 3 c_{22} T_1^2 T_2^2 - 2 c_{22}^2 T_1^2 T_2^2 - c_{22} c_{36} T_1^2 T_2^2 - c_{22} c_{69} T_1^2 T_2^2 + 3 c_{22} c_{81} T_1^2 T_2^2 + 2 c_{22} c_{86} T_1^2 T_2^2 - \\
 & 3 c_{22} T_1^3 T_2^2 + c_{15} c_{22} T_1^3 T_2^2 + 3 c_{22} c_{56} T_1^3 T_2^2 + 2 c_{22} c_{69} T_1^3 T_2^2 + c_{22} c_{81} T_1^3 T_2^2 - c_{15} c_{22} T_2^3 - \\
 & c_{22} c_{36} T_2^3 - 3 c_{22} T_1 T_2^3 - c_{22}^2 T_1 T_2^3 - c_{22} c_{36} T_1 T_2^3 + c_{22} c_{56} T_1 T_2^3 + 2 c_{22} c_{81} T_1 T_2^3 + \\
 & c_{22} c_{86} T_1 T_2^3 - 3 c_{22} T_1^2 T_2^3 + 3 c_{15} c_{22} T_1^2 T_2^3 + c_{22}^2 T_1^2 T_2^3 + 2 c_{22} c_{36} T_1^2 T_2^3 + 2 c_{22} c_{56} T_1^2 T_2^3 + \\
 & c_{22} c_{69} T_1^2 T_2^3 - c_{22} c_{86} T_1^2 T_2^3 + 6 c_{22} T_1^3 T_2^3 - 2 c_{15} c_{22} T_1^3 T_2^3 - 3 c_{22} c_{56} T_1^3 T_2^3 - c_{22} c_{69} T_1^3 T_2^3 - \\
 & 2 c_{22} c_{81} T_1^3 T_2^3 + c_{15} c_{22} T_1 T_2^4 + c_{22} c_{36} T_1 T_2^4 + 3 c_{22} T_1^2 T_2^4 - 2 c_{15} c_{22} T_1^2 T_2^4 - c_{22} c_{36} T_1^2 T_2^4 - \\
 & c_{22} c_{56} T_1^2 T_2^4 - c_{22} c_{81} T_1^2 T_2^4 - 3 c_{22} T_1^3 T_2^4 + c_{15} c_{22} T_1^3 T_2^4 + c_{22} c_{56} T_1^3 T_2^4 + c_{22} c_{81} T_1^3 T_2^4 + \\
 & c_{81} \alpha_4 + c_{86} \alpha_4 - c_{22} T_1 \alpha_4 + c_{56} T_1 \alpha_4 + c_{69} T_1 \alpha_4 + c_{15} T_2 \alpha_4 - c_{22} T_2 \alpha_4 + c_{36} T_2 \alpha_4 - \\
 & c_{54} T_2 \alpha_4 - 2 c_{81} T_2 \alpha_4 - 2 c_{86} T_2 \alpha_4 + 3 T_1 T_2 \alpha_4 - c_{15} T_1 T_2 \alpha_4 + 3 c_{22} T_1 T_2 \alpha_4 + c_{54} T_1 T_2 \alpha_4 - \\
 & 3 c_{56} T_1 T_2 \alpha_4 - 2 c_{69} T_1 T_2 \alpha_4 - 2 c_{81} T_1 T_2 \alpha_4 - c_{86} T_1 T_2 \alpha_4 + c_{22} T_1^2 T_2 \alpha_4 - c_{56} T_1^2 T_2 \alpha_4 - \\
 & c_{69} T_1^2 T_2 \alpha_4 - 2 c_{15} T_2^2 \alpha_4 + c_{22} T_2^2 \alpha_4 - 2 c_{36} T_2^2 \alpha_4 + c_{54} T_2^2 \alpha_4 + c_{81} T_2^2 \alpha_4 + c_{86} T_2^2 \alpha_4 - \\
 & 6 T_1 T_2^2 \alpha_4 + c_{15} T_1 T_2^2 \alpha_4 - 3 c_{22} T_1 T_2^2 \alpha_4 - c_{36} T_1 T_2^2 \alpha_4 - c_{54} T_1 T_2^2 \alpha_4 + 3 c_{56} T_1 T_2^2 \alpha_4 + \\
 & c_{69} T_1 T_2^2 \alpha_4 + 4 c_{81} T_1 T_2^2 \alpha_4 + 2 c_{86} T_1 T_2^2 \alpha_4 - 3 T_1^2 T_2^2 \alpha_4 + c_{15} T_1^2 T_2^2 \alpha_4 - c_{22} T_1^2 T_2^2 \alpha_4 +
 \end{aligned}$$

$$\begin{aligned}
 & 3 c_{56} T_1^2 T_2^2 \alpha_4 + 2 c_{69} T_1^2 T_2^2 \alpha_4 + c_{81} T_1^2 T_2^2 \alpha_4 + c_{15} T_2^3 \alpha_4 + c_{36} T_2^3 \alpha_4 + 3 T_1 T_2^3 \alpha_4 + c_{15} T_1 T_2^3 \alpha_4 + \\
 & c_{22} T_1 T_2^3 \alpha_4 + 2 c_{36} T_1 T_2^3 \alpha_4 - c_{56} T_1 T_2^3 \alpha_4 - 2 c_{81} T_1 T_2^3 \alpha_4 - c_{86} T_1 T_2^3 \alpha_4 + 6 T_1^2 T_2^3 \alpha_4 - \\
 & 2 c_{15} T_1^2 T_2^3 \alpha_4 - 3 c_{56} T_1^2 T_2^3 \alpha_4 - c_{69} T_1^2 T_2^3 \alpha_4 - 2 c_{81} T_1^2 T_2^3 \alpha_4 - c_{15} T_1 T_2^4 \alpha_4 - c_{36} T_1 T_2^4 \alpha_4 - \\
 & 3 T_1^2 T_2^4 \alpha_4 + c_{15} T_1^2 T_2^4 \alpha_4 + c_{56} T_1^2 T_2^4 \alpha_4 + c_{81} T_1^2 T_2^4 \alpha_4 - \alpha_4^2 + T_2 \alpha_4^2 + T_1 T_2 \alpha_4^2 - T_2^2 \alpha_4^2) \\
 & p_{2,j} p_{3,i} x_{2,i} x_{3,i} / ((-1 + T_1) T_2 (-1 + T_1 T_2) (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) - \\
 & ((c_{22}^2 - c_{22} c_{65} - c_{22} c_{81} - c_{22} c_{86} - c_{22} c_{56} T_1 + c_{22} c_{65} T_1 - c_{22} c_{69} T_1 + c_{22} c_{81} T_1 + c_{22} c_{86} T_1 - c_{22}^2 T_1^2 + \\
 & c_{22} c_{56} T_1^2 + c_{22} c_{69} T_1^2 - c_{15} c_{22} T_2 - 2 c_{22}^2 T_2 - c_{22} c_{36} T_2 + c_{22} c_{65} T_2 + 2 c_{22} c_{81} T_2 + 2 c_{22} c_{86} T_2 - \\
 & 3 c_{22} T_1 T_2 + 2 c_{15} c_{22} T_1 T_2 - c_{22}^2 T_1 T_2 + c_{22} c_{36} T_1 T_2 + 3 c_{22} c_{56} T_1 T_2 + 2 c_{22} c_{69} T_1 T_2 - \\
 & c_{22} c_{86} T_1 T_2 + 3 c_{22} T_1^2 T_2 - c_{15} c_{22} T_1^2 T_2 + 3 c_{22}^2 T_1^2 T_2 - 2 c_{22} c_{56} T_1^2 T_2 - c_{22} c_{65} T_1^2 T_2 - \\
 & c_{22} c_{69} T_1^2 T_2 - 2 c_{22} c_{81} T_1^2 T_2 - c_{22} c_{86} T_1^2 T_2 - c_{22} c_{56} T_1^3 T_2 - c_{22} c_{69} T_1^3 T_2 + 2 c_{15} c_{22} T_2^2 + c_{22}^2 T_2^2 + \\
 & 2 c_{22} c_{36} T_2^2 - c_{22} c_{81} T_2^2 - c_{22} c_{86} T_2^2 + 6 c_{22} T_1 T_2^2 - 3 c_{15} c_{22} T_1 T_2^2 + 2 c_{22}^2 T_1 T_2^2 - c_{22} c_{36} T_1 T_2^2 - \\
 & 3 c_{22} c_{56} T_1 T_2^2 - c_{22} c_{65} T_1 T_2^2 - c_{22} c_{69} T_1 T_2^2 - 3 c_{22} c_{81} T_1 T_2^2 - c_{22} c_{86} T_1 T_2^2 - 3 c_{22} T_1^2 T_2^2 - \\
 & 3 c_{22}^2 T_1^2 T_2^2 - c_{22} c_{36} T_1^2 T_2^2 + c_{22} c_{65} T_1^2 T_2^2 - c_{22} c_{69} T_1^2 T_2^2 + 3 c_{22} c_{81} T_1^2 T_2^2 + 2 c_{22} c_{86} T_1^2 T_2^2 - \\
 & 3 c_{22} T_1^3 T_2^2 + c_{15} c_{22} T_1^3 T_2^2 + 3 c_{22} c_{56} T_1^3 T_2^2 + 2 c_{22} c_{69} T_1^3 T_2^2 + c_{22} c_{81} T_1^3 T_2^2 - c_{15} c_{22} T_2^3 - \\
 & c_{22} c_{36} T_2^3 - 3 c_{22} T_1 T_2^3 - c_{22}^2 T_1 T_2^3 - c_{22} c_{36} T_1 T_2^3 + c_{22} c_{56} T_1 T_2^3 + 2 c_{22} c_{81} T_1 T_2^3 + c_{22} c_{86} T_1 T_2^3 - \\
 & 3 c_{22} T_1^2 T_2^3 + 3 c_{15} c_{22} T_1^2 T_2^3 + c_{22}^2 T_1^2 T_2^3 + 2 c_{22} c_{36} T_1^2 T_2^3 + 2 c_{22} c_{56} T_1^2 T_2^3 + c_{22} c_{69} T_1^2 T_2^3 - \\
 & c_{22} c_{86} T_1^2 T_2^3 + 6 c_{22} T_1^3 T_2^3 - 2 c_{15} c_{22} T_1^3 T_2^3 - 3 c_{22} c_{56} T_1^3 T_2^3 - c_{22} c_{69} T_1^3 T_2^3 - 2 c_{22} c_{81} T_1^3 T_2^3 + \\
 & c_{15} c_{22} T_1 T_2^4 + c_{22} c_{36} T_1 T_2^4 + 3 c_{22} T_1^2 T_2^4 - 2 c_{15} c_{22} T_1^2 T_2^4 - c_{22} c_{36} T_1^2 T_2^4 - c_{22} c_{56} T_1^2 T_2^4 - \\
 & c_{22} c_{81} T_1^2 T_2^4 - 3 c_{22} T_1^3 T_2^4 + c_{15} c_{22} T_1^3 T_2^4 + c_{22} c_{56} T_1^3 T_2^4 + c_{22} c_{81} T_1^3 T_2^4 + c_{22} \alpha_4 + c_{81} \alpha_4 + c_{86} \alpha_4 - \\
 & 2 c_{22} T_1 \alpha_4 + c_{56} T_1 \alpha_4 + c_{69} T_1 \alpha_4 + c_{15} T_2 \alpha_4 + c_{36} T_2 \alpha_4 - c_{65} T_2 \alpha_4 - 2 c_{81} T_2 \alpha_4 - 2 c_{86} T_2 \alpha_4 + \\
 & 3 T_1 T_2 \alpha_4 - c_{15} T_1 T_2 \alpha_4 + 3 c_{22} T_1 T_2 \alpha_4 - 3 c_{56} T_1 T_2 \alpha_4 + c_{65} T_1 T_2 \alpha_4 - 2 c_{69} T_1 T_2 \alpha_4 - \\
 & 2 c_{81} T_1 T_2 \alpha_4 - c_{86} T_1 T_2 \alpha_4 - c_{56} T_1^2 T_2 \alpha_4 - c_{69} T_1^2 T_2 \alpha_4 - 2 c_{15} T_2^2 \alpha_4 - c_{22} T_2^2 \alpha_4 - 2 c_{36} T_2^2 \alpha_4 + \\
 & c_{81} T_2^2 \alpha_4 + c_{86} T_2^2 \alpha_4 - 6 T_1 T_2^2 \alpha_4 + c_{15} T_1 T_2^2 \alpha_4 - 2 c_{22} T_1 T_2^2 \alpha_4 - c_{36} T_1 T_2^2 \alpha_4 + 3 c_{56} T_1 T_2^2 \alpha_4 + \\
 & c_{65} T_1 T_2^2 \alpha_4 + c_{69} T_1 T_2^2 \alpha_4 + 4 c_{81} T_1 T_2^2 \alpha_4 + 2 c_{86} T_1 T_2^2 \alpha_4 - 3 T_1^2 T_2^2 \alpha_4 + c_{15} T_1^2 T_2^2 \alpha_4 + \\
 & 3 c_{56} T_1^2 T_2^2 \alpha_4 - c_{65} T_1^2 T_2^2 \alpha_4 + 2 c_{69} T_1^2 T_2^2 \alpha_4 + c_{81} T_1^2 T_2^2 \alpha_4 + c_{15} T_2^3 \alpha_4 + c_{36} T_2^3 \alpha_4 + 3 T_1 T_2^3 \alpha_4 + \\
 & c_{15} T_1 T_2^3 \alpha_4 + c_{22} T_1 T_2^3 \alpha_4 + 2 c_{36} T_1 T_2^3 \alpha_4 - c_{56} T_1 T_2^3 \alpha_4 - 2 c_{81} T_1 T_2^3 \alpha_4 - c_{86} T_1 T_2^3 \alpha_4 + \\
 & 6 T_1^2 T_2^3 \alpha_4 - 2 c_{15} T_1^2 T_2^3 \alpha_4 - 3 c_{56} T_1^2 T_2^3 \alpha_4 - c_{69} T_1^2 T_2^3 \alpha_4 - 2 c_{81} T_1^2 T_2^3 \alpha_4 - c_{15} T_1 T_2^4 \alpha_4 - \\
 & c_{36} T_1 T_2^4 \alpha_4 - 3 T_1^2 T_2^4 \alpha_4 + c_{15} T_1^2 T_2^4 \alpha_4 + c_{56} T_1^2 T_2^4 \alpha_4 + c_{81} T_1^2 T_2^4 \alpha_4 - \alpha_4^2 + 2 T_2 \alpha_4^2 - T_1 T_2^2 \alpha_4^2) \\
 & p_{2,i} p_{3,j} x_{2,i} x_{3,i} / ((-1 + T_1) T_1 (-1 + T_2) T_2 (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) + \\
 & ((c_{22}^2 - c_{22} c_{54} - c_{22} c_{65} - c_{22} c_{81} - c_{22} c_{86} + c_{22} c_{54} T_1 - c_{22} c_{56} T_1 + c_{22} c_{65} T_1 - c_{22} c_{69} T_1 + \\
 & c_{22} c_{81} T_1 + c_{22} c_{86} T_1 - c_{22}^2 T_1^2 + c_{22} c_{56} T_1^2 + c_{22} c_{69} T_1^2 - c_{15} c_{22} T_2 - 2 c_{22}^2 T_2 - c_{22} c_{36} T_2 + \\
 & 2 c_{22} c_{54} T_2 + c_{22} c_{65} T_2 + 3 c_{22} c_{81} T_2 + 3 c_{22} c_{86} T_2 - 3 c_{22} T_1 T_2 + 2 c_{15} c_{22} T_1 T_2 - 2 c_{22}^2 T_1 T_2 + \\
 & c_{22} c_{36} T_1 T_2 - 2 c_{22} c_{54} T_1 T_2 + 4 c_{22} c_{56} T_1 T_2 + 3 c_{22} c_{69} T_1 T_2 - c_{22} c_{81} T_1 T_2 - 2 c_{22} c_{86} T_1 T_2 + \\
 & 3 c_{22} T_1^2 T_2 - c_{15} c_{22} T_1^2 T_2 + 4 c_{22}^2 T_1^2 T_2 - 3 c_{22} c_{56} T_1^2 T_2 - c_{22} c_{65} T_1^2 T_2 - 2 c_{22} c_{69} T_1^2 T_2 - \\
 & 2 c_{22} c_{81} T_1^2 T_2 - c_{22} c_{86} T_1^2 T_2 - c_{22} c_{56} T_1^3 T_2 - c_{22} c_{69} T_1^3 T_2 + 3 c_{15} c_{22} T_2^2 + c_{22}^2 T_2^2 + 3 c_{22} c_{36} T_2^2 - \\
 & c_{22} c_{54} T_2^2 - 2 c_{22} c_{81} T_2^2 - 2 c_{22} c_{86} T_2^2 + 9 c_{22} T_1 T_2^2 - 5 c_{15} c_{22} T_1 T_2^2 + 4 c_{22}^2 T_1 T_2^2 - 2 c_{22} c_{36} T_1 T_2^2 + \\
 & c_{22} c_{54} T_1 T_2^2 - 5 c_{22} c_{56} T_1 T_2^2 - c_{22} c_{65} T_1 T_2^2 - 2 c_{22} c_{69} T_1 T_2^2 - 4 c_{22} c_{81} T_1 T_2^2 - c_{22} c_{86} T_1 T_2^2 - \\
 & 6 c_{22} T_1^2 T_2^2 + c_{15} c_{22} T_1^2 T_2^2 - 5 c_{22}^2 T_1^2 T_2^2 - c_{22} c_{36} T_1^2 T_2^2 + c_{22} c_{56} T_1^2 T_2^2 + c_{22} c_{65} T_1^2 T_2^2 - \\
 & c_{22} c_{69} T_1^2 T_2^2 + 5 c_{22} c_{81} T_1^2 T_2^2 + 3 c_{22} c_{86} T_1^2 T_2^2 - 3 c_{22} T_1^3 T_2^2 + c_{15} c_{22} T_1^3 T_2^2 + 4 c_{22} c_{56} T_1^3 T_2^2 + \\
 & 3 c_{22} c_{69} T_1^3 T_2^2 + c_{22} c_{81} T_1^3 T_2^2 - 2 c_{15} c_{22} T_2^3 - 2 c_{22} c_{36} T_2^3 - 6 c_{22} T_1 T_2^3 + c_{15} c_{22} T_1 T_2^3 - \\
 & 2 c_{22}^2 T_1 T_2^3 - c_{22} c_{36} T_1 T_2^3 + 2 c_{22} c_{56} T_1 T_2^3 + 4 c_{22} c_{81} T_1 T_2^3 + 2 c_{22} c_{86} T_1 T_2^3 - 3 c_{22} T_1^2 T_2^3 + \\
 & 4 c_{15} c_{22} T_1^2 T_2^3 + 2 c_{22}^2 T_1^2 T_2^3 + 3 c_{22} c_{36} T_1^2 T_2^3 + 3 c_{22} c_{56} T_1^2 T_2^3 + 2 c_{22} c_{69} T_1^2 T_2^3 - c_{22} c_{81} T_1^2 T_2^3 - \\
 & 2 c_{22} c_{86} T_1^2 T_2^3 + 9 c_{22} T_1^3 T_2^3 - 3 c_{15} c_{22} T_1^3 T_2^3 - 5 c_{22} c_{56} T_1^3 T_2^3 - 2 c_{22} c_{69} T_1^3 T_2^3 - 3 c_{22} c_{81} T_1^3 T_2^3 + \\
 & 2 c_{15} c_{22} T_1 T_2^4 + 2 c_{22} c_{36} T_1 T_2^4 + 6 c_{22} T_1^2 T_2^4 - 4 c_{15} c_{22} T_1^2 T_2^4 - 2 c_{22} c_{36} T_1^2 T_2^4 - 2 c_{22} c_{56} T_1^2 T_2^4 - \\
 & 2 c_{22} c_{81} T_1^2 T_2^4 - 6 c_{22} T_1^3 T_2^4 + 2 c_{15} c_{22} T_1^3 T_2^4 + 2 c_{22} c_{56} T_1^3 T_2^4 + 2 c_{22} c_{81} T_1^3 T_2^4 + c_{22} \alpha_4 + c_{81} \alpha_4 + \\
 & c_{86} \alpha_4 - 2 c_{22} T_1 \alpha_4 + c_{56} T_1 \alpha_4 + c_{69} T_1 \alpha_4 + c_{15} T_2 \alpha_4 - c_{22} T_2 \alpha_4 + c_{36} T_2 \alpha_4 - c_{54} T_2 \alpha_4 -
 \end{aligned}$$

$$\begin{aligned}
 & c_{65} T_2 \alpha_4 - 3 c_{81} T_2 \alpha_4 - 3 c_{86} T_2 \alpha_4 + 3 T_1 T_2 \alpha_4 - c_{15} T_1 T_2 \alpha_4 + 5 c_{22} T_1 T_2 \alpha_4 + c_{54} T_1 T_2 \alpha_4 - \\
 & 4 c_{56} T_1 T_2 \alpha_4 + c_{65} T_1 T_2 \alpha_4 - 3 c_{69} T_1 T_2 \alpha_4 - 2 c_{81} T_1 T_2 \alpha_4 - c_{86} T_1 T_2 \alpha_4 - c_{56} T_1^2 T_2 \alpha_4 - \\
 & c_{69} T_1^2 T_2 \alpha_4 - 3 c_{15} T_2^2 \alpha_4 - 3 c_{36} T_2^2 \alpha_4 + c_{54} T_2^2 \alpha_4 + 2 c_{81} T_2^2 \alpha_4 + 2 c_{86} T_2^2 \alpha_4 - 9 T_1 T_2^2 \alpha_4 + \\
 & 2 c_{15} T_1 T_2^2 \alpha_4 - 5 c_{22} T_1 T_2^2 \alpha_4 - c_{36} T_1 T_2^2 \alpha_4 - c_{54} T_1 T_2^2 \alpha_4 + 5 c_{56} T_1 T_2^2 \alpha_4 + c_{65} T_1 T_2^2 \alpha_4 + \\
 & 2 c_{69} T_1 T_2^2 \alpha_4 + 6 c_{81} T_1 T_2^2 \alpha_4 + 3 c_{86} T_1 T_2^2 \alpha_4 - 3 T_1^2 T_2^2 \alpha_4 + c_{15} T_1^2 T_2^2 \alpha_4 + 4 c_{56} T_1^2 T_2^2 \alpha_4 - \\
 & c_{65} T_1^2 T_2^2 \alpha_4 + 3 c_{69} T_1^2 T_2^2 \alpha_4 + c_{81} T_1^2 T_2^2 \alpha_4 + 2 c_{15} T_2^3 \alpha_4 + 2 c_{36} T_2^3 \alpha_4 + 6 T_1 T_2^3 \alpha_4 + c_{15} T_1 T_2^3 \alpha_4 + \\
 & 2 c_{22} T_1 T_2^3 \alpha_4 + 3 c_{36} T_1 T_2^3 \alpha_4 - 2 c_{56} T_1 T_2^3 \alpha_4 - 4 c_{81} T_1 T_2^3 \alpha_4 - 2 c_{86} T_1 T_2^3 \alpha_4 + 9 T_1^2 T_2^3 \alpha_4 - \\
 & 3 c_{15} T_1^2 T_2^3 \alpha_4 - 5 c_{56} T_1^2 T_2^3 \alpha_4 - 2 c_{69} T_1^2 T_2^3 \alpha_4 - 3 c_{81} T_1^2 T_2^3 \alpha_4 - 2 c_{15} T_1 T_2^4 \alpha_4 - 2 c_{36} T_1 T_2^4 \alpha_4 - \\
 & 6 T_1^2 T_2^4 \alpha_4 + 2 c_{15} T_1^2 T_2^4 \alpha_4 + 2 c_{56} T_1^2 T_2^4 \alpha_4 + 2 c_{81} T_1^2 T_2^4 \alpha_4 - \alpha_4^2 + 3 T_2 \alpha_4^2 - T_2^2 \alpha_4^2 - T_1 T_2^2 \alpha_4^2) \\
 & p_{2,j} p_{3,j} x_{2,i} x_{3,i} / ((-1 + T_1) T_1 T_2^2 (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) - \\
 & ((-c_{22} c_{54} + c_{22} c_{65} - c_{22} c_{81} - c_{22} c_{86} + c_{22} c_{54} T_1 - c_{22} c_{56} T_1 - c_{22} c_{65} T_1 - c_{22} c_{69} T_1 + \\
 & c_{22} c_{81} T_1 + c_{22} c_{86} T_1 + c_{22} c_{56} T_1^2 + c_{22} c_{69} T_1^2 - c_{15} c_{22} T_2 - c_{22} c_{36} T_2 + 2 c_{22} c_{54} T_2 - \\
 & c_{22} c_{65} T_2 + 2 c_{22} c_{81} T_2 + 2 c_{22} c_{86} T_2 - 3 c_{22} T_1 T_2 + 2 c_{15} c_{22} T_1 T_2 - c_{22}^2 T_1 T_2 + c_{22} c_{36} T_1 T_2 - \\
 & 2 c_{22} c_{54} T_1 T_2 + 3 c_{22} c_{56} T_1 T_2 + 2 c_{22} c_{69} T_1 T_2 - c_{22} c_{86} T_1 T_2 + 3 c_{22} T_1^2 T_2 - c_{15} c_{22} T_1^2 T_2 + \\
 & c_{22}^2 T_1^2 T_2 - 2 c_{22} c_{56} T_1^2 T_2 + c_{22} c_{65} T_1^2 T_2 - c_{22} c_{69} T_1^2 T_2 - 2 c_{22} c_{81} T_1^2 T_2 - c_{22} c_{86} T_1^2 T_2 - \\
 & c_{22} c_{56} T_1^3 T_2 - c_{22} c_{69} T_1^3 T_2 + 2 c_{15} c_{22} T_2^2 + 2 c_{22} c_{36} T_2^2 - c_{22} c_{54} T_2^2 - c_{22} c_{81} T_2^2 - c_{22} c_{86} T_2^2 + \\
 & 6 c_{22} T_1 T_2^2 - 3 c_{15} c_{22} T_1 T_2^2 + 2 c_{22}^2 T_1 T_2^2 - c_{22} c_{36} T_1 T_2^2 + c_{22} c_{54} T_1 T_2^2 - 3 c_{22} c_{56} T_1 T_2^2 + \\
 & c_{22} c_{65} T_1 T_2^2 - c_{22} c_{69} T_1 T_2^2 - 3 c_{22} c_{81} T_1 T_2^2 - c_{22} c_{86} T_1 T_2^2 - 3 c_{22} T_1^2 T_2^2 - 2 c_{22}^2 T_1^2 T_2^2 - \\
 & c_{22} c_{36} T_1^2 T_2^2 - c_{22} c_{65} T_1^2 T_2^2 - c_{22} c_{69} T_1^2 T_2^2 + 3 c_{22} c_{81} T_1^2 T_2^2 + 2 c_{22} c_{86} T_1^2 T_2^2 - 3 c_{22} T_1^3 T_2^2 + \\
 & c_{15} c_{22} T_1^3 T_2^2 + 3 c_{22} c_{56} T_1^3 T_2^2 + 2 c_{22} c_{69} T_1^3 T_2^2 + c_{22} c_{81} T_1^3 T_2^2 - c_{15} c_{22} T_2^3 - c_{22} c_{36} T_2^3 - \\
 & 3 c_{22} T_1 T_2^3 - c_{22}^2 T_1 T_2^3 - c_{22} c_{36} T_1 T_2^3 + c_{22} c_{56} T_1 T_2^3 + 2 c_{22} c_{81} T_1 T_2^3 + c_{22} c_{86} T_1 T_2^3 - \\
 & 3 c_{22} T_1^2 T_2^3 + 3 c_{15} c_{22} T_1^2 T_2^3 + c_{22}^2 T_1^2 T_2^3 + 2 c_{22} c_{36} T_1^2 T_2^3 + 2 c_{22} c_{56} T_1^2 T_2^3 + c_{22} c_{69} T_1^2 T_2^3 - \\
 & c_{22} c_{86} T_1^2 T_2^3 + 6 c_{22} T_1^3 T_2^3 - 2 c_{15} c_{22} T_1^3 T_2^3 - 3 c_{22} c_{56} T_1^3 T_2^3 - c_{22} c_{69} T_1^3 T_2^3 - 2 c_{22} c_{81} T_1^3 T_2^3 + \\
 & c_{15} c_{22} T_1 T_2^4 + c_{22} c_{36} T_1 T_2^4 + 3 c_{22} T_1^2 T_2^4 - 2 c_{15} c_{22} T_1^2 T_2^4 - c_{22} c_{36} T_1^2 T_2^4 - c_{22} c_{56} T_1^2 T_2^4 - \\
 & c_{22} c_{81} T_1^2 T_2^4 - 3 c_{22} T_1^3 T_2^4 + c_{15} c_{22} T_1^3 T_2^4 + c_{22} c_{56} T_1^3 T_2^4 + c_{22} c_{81} T_1^3 T_2^4 + c_{81} \alpha_4 + c_{86} \alpha_4 - \\
 & c_{22} T_1 \alpha_4 + c_{56} T_1 \alpha_4 + c_{69} T_1 \alpha_4 + c_{15} T_2 \alpha_4 - c_{22} T_2 \alpha_4 + c_{36} T_2 \alpha_4 - c_{54} T_2 \alpha_4 + c_{65} T_2 \alpha_4 - \\
 & 2 c_{81} T_2 \alpha_4 - 2 c_{86} T_2 \alpha_4 + 3 T_1 T_2 \alpha_4 - c_{15} T_1 T_2 \alpha_4 + 3 c_{22} T_1 T_2 \alpha_4 + c_{54} T_1 T_2 \alpha_4 - \\
 & 3 c_{56} T_1 T_2 \alpha_4 - c_{65} T_1 T_2 \alpha_4 - 2 c_{69} T_1 T_2 \alpha_4 - 2 c_{81} T_1 T_2 \alpha_4 - c_{86} T_1 T_2 \alpha_4 + c_{22} T_1^2 T_2 \alpha_4 - \\
 & c_{56} T_1^2 T_2 \alpha_4 - c_{69} T_1^2 T_2 \alpha_4 - 2 c_{15} T_2^2 \alpha_4 + c_{22} T_2^2 \alpha_4 - 2 c_{36} T_2^2 \alpha_4 + c_{54} T_2^2 \alpha_4 + c_{81} T_2^2 \alpha_4 + \\
 & c_{86} T_2^2 \alpha_4 - 6 T_1 T_2^2 \alpha_4 + c_{15} T_1 T_2^2 \alpha_4 - 3 c_{22} T_1 T_2^2 \alpha_4 - c_{36} T_1 T_2^2 \alpha_4 - c_{54} T_1 T_2^2 \alpha_4 + \\
 & 3 c_{56} T_1 T_2^2 \alpha_4 - c_{65} T_1 T_2^2 \alpha_4 + c_{69} T_1 T_2^2 \alpha_4 + 4 c_{81} T_1 T_2^2 \alpha_4 + 2 c_{86} T_1 T_2^2 \alpha_4 - 3 T_1^2 T_2^2 \alpha_4 + \\
 & c_{15} T_1^2 T_2^2 \alpha_4 - c_{22} T_1^2 T_2^2 \alpha_4 + 3 c_{56} T_1^2 T_2^2 \alpha_4 + c_{65} T_1^2 T_2^2 \alpha_4 + 2 c_{69} T_1^2 T_2^2 \alpha_4 + c_{81} T_1^2 T_2^2 \alpha_4 + \\
 & c_{15} T_2^3 \alpha_4 + c_{36} T_2^3 \alpha_4 + 3 T_1 T_2^3 \alpha_4 + c_{15} T_1 T_2^3 \alpha_4 + c_{22} T_1 T_2^3 \alpha_4 + 2 c_{36} T_1 T_2^3 \alpha_4 - \\
 & c_{56} T_1 T_2^3 \alpha_4 - 2 c_{81} T_1 T_2^3 \alpha_4 - c_{86} T_1 T_2^3 \alpha_4 + 6 T_1^2 T_2^3 \alpha_4 - 2 c_{15} T_1^2 T_2^3 \alpha_4 - 3 c_{56} T_1^2 T_2^3 \alpha_4 - \\
 & c_{69} T_1^2 T_2^3 \alpha_4 - 2 c_{81} T_1^2 T_2^3 \alpha_4 - c_{15} T_1 T_2^4 \alpha_4 - c_{36} T_1 T_2^4 \alpha_4 - 3 T_1^2 T_2^4 \alpha_4 + c_{15} T_1^2 T_2^4 \alpha_4 + \\
 & c_{56} T_1^2 T_2^4 \alpha_4 + c_{81} T_1^2 T_2^4 \alpha_4 - \alpha_4^2 + T_2 \alpha_4^2 + T_1 T_2 \alpha_4^2 - T_2^2 \alpha_4^2) p_{2,j} p_{3,i} x_{2,j} x_{3,i} / \\
 & ((-1 + T_1) (-1 + T_2) (-1 + T_1 T_2) (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) + \\
 & ((c_{81} + c_{86} - c_{22} T_1 + c_{56} T_1 + c_{69} T_1 + c_{15} T_2 + c_{36} T_2 + 3 T_1 T_2 - c_{15} T_1 T_2 + \\
 & c_{22} T_1 T_2 - c_{56} T_1 T_2 - 2 c_{81} T_1 T_2 - c_{86} T_1 T_2 - c_{56} T_1^2 T_2 - c_{69} T_1^2 T_2 - \\
 & c_{15} T_1 T_2^2 - c_{36} T_1 T_2^2 - 3 T_1^2 T_2^2 + c_{15} T_1^2 T_2^2 + c_{56} T_1^2 T_2^2 + c_{81} T_1^2 T_2^2 - \alpha_4) \\
 & \alpha_4 p_{2,i} p_{3,j} x_{2,j} x_{3,i} / ((-1 + T_1) T_1 (c_{22} - c_{22} T_2 + T_2 \alpha_4)) + \\
 & ((c_{22} c_{54} + c_{22} c_{81} + c_{22} c_{86} - c_{22} c_{54} T_1 + c_{22} c_{56} T_1 + c_{22} c_{69} T_1 - c_{22} c_{81} T_1 - c_{22} c_{86} T_1 - \\
 & c_{22} c_{56} T_1^2 - c_{22} c_{69} T_1^2 + c_{15} c_{22} T_2 + c_{22} c_{36} T_2 - c_{22} c_{54} T_2 - c_{22} c_{81} T_2 - c_{22} c_{86} T_2 + 3 c_{22} T_1 T_2 - \\
 & 2 c_{15} c_{22} T_1 T_2 + c_{22}^2 T_1 T_2 - c_{22} c_{36} T_1 T_2 + c_{22} c_{54} T_1 T_2 - 2 c_{22} c_{56} T_1 T_2 - c_{22} c_{69} T_1 T_2 - \\
 & c_{22} c_{81} T_1 T_2 - 3 c_{22} T_1^2 T_2 + c_{15} c_{22} T_1^2 T_2 - c_{22}^2 T_1^2 T_2 + c_{22} c_{56} T_1^2 T_2 + 2 c_{22} c_{81} T_1^2 T_2 +
 \end{aligned}$$

$$\begin{aligned}
 & c_{22} c_{86} T_1^2 T_2 + c_{22} c_{56} T_1^3 T_2 + c_{22} c_{69} T_1^3 T_2 - c_{15} c_{22} T_2^2 - c_{22} c_{36} T_2^2 - 3 c_{22} T_1 T_2^2 + c_{15} c_{22} T_1 T_2^2 - \\
 & c_{22}^2 T_1 T_2^2 + c_{22} c_{56} T_1 T_2^2 + 2 c_{22} c_{81} T_1 T_2^2 + c_{22} c_{86} T_1 T_2^2 + c_{15} c_{22} T_1^2 T_2^2 + c_{22}^2 T_1^2 T_2^2 + \\
 & c_{22} c_{36} T_1^2 T_2^2 + c_{22} c_{56} T_1^2 T_2^2 + c_{22} c_{69} T_1^2 T_2^2 - c_{22} c_{81} T_1^2 T_2^2 - c_{22} c_{86} T_1^2 T_2^2 + 3 c_{22} T_1^3 T_2^2 - \\
 & c_{15} c_{22} T_1^3 T_2^2 - 2 c_{22} c_{56} T_1^3 T_2^2 - c_{22} c_{69} T_1^3 T_2^2 - c_{22} c_{81} T_1^3 T_2^2 + c_{15} c_{22} T_1 T_2^3 + c_{22} c_{36} T_1 T_2^3 + \\
 & 3 c_{22} T_1^2 T_2^3 - 2 c_{15} c_{22} T_1^2 T_2^3 - c_{22} c_{36} T_1^2 T_2^3 - c_{22} c_{56} T_1^2 T_2^3 - c_{22} c_{81} T_1^2 T_2^3 - 3 c_{22} T_1^3 T_2^3 + \\
 & c_{15} c_{22} T_1^3 T_2^3 + c_{22} c_{56} T_1^3 T_2^3 + c_{22} c_{81} T_1^3 T_2^3 - c_{22} \alpha_4 - c_{81} \alpha_4 - c_{86} \alpha_4 + 2 c_{22} T_1 \alpha_4 - c_{56} T_1 \alpha_4 - \\
 & c_{69} T_1 \alpha_4 - c_{15} T_2 \alpha_4 + c_{22} T_2 \alpha_4 - c_{36} T_2 \alpha_4 + c_{54} T_2 \alpha_4 + 2 c_{81} T_2 \alpha_4 + 2 c_{86} T_2 \alpha_4 - 3 T_1 T_2 \alpha_4 + \\
 & c_{15} T_1 T_2 \alpha_4 - 3 c_{22} T_1 T_2 \alpha_4 - c_{54} T_1 T_2 \alpha_4 + 3 c_{56} T_1 T_2 \alpha_4 + 2 c_{69} T_1 T_2 \alpha_4 + 2 c_{81} T_1 T_2 \alpha_4 + \\
 & c_{86} T_1 T_2 \alpha_4 - c_{22} T_1^2 T_2 \alpha_4 + c_{56} T_1^2 T_2 \alpha_4 + c_{69} T_1^2 T_2 \alpha_4 + 2 c_{15} T_2^2 \alpha_4 + 2 c_{36} T_2^2 \alpha_4 + 6 T_1 T_2^2 \alpha_4 - \\
 & c_{15} T_1 T_2^2 \alpha_4 + 2 c_{22} T_1 T_2^2 \alpha_4 + c_{36} T_1 T_2^2 \alpha_4 - 2 c_{56} T_1 T_2^2 \alpha_4 - 4 c_{81} T_1 T_2^2 \alpha_4 - 2 c_{86} T_1 T_2^2 \alpha_4 + \\
 & 3 T_1^2 T_2^2 \alpha_4 - c_{15} T_1^2 T_2^2 \alpha_4 - 3 c_{56} T_1^2 T_2^2 \alpha_4 - 2 c_{69} T_1^2 T_2^2 \alpha_4 - c_{81} T_1^2 T_2^2 \alpha_4 - 2 c_{15} T_1 T_2^3 \alpha_4 - \\
 & 2 c_{36} T_1 T_2^3 \alpha_4 - 6 T_1^2 T_2^3 \alpha_4 + 2 c_{15} T_1^2 T_2^3 \alpha_4 + 2 c_{56} T_1^2 T_2^3 \alpha_4 + 2 c_{81} T_1^2 T_2^3 \alpha_4 + \alpha_4^2 - 2 T_2 \alpha_4^2) \\
 & p_{2,j} p_{3,j} x_{2,j} x_{3,i} / ((-1 + T_1) T_1 T_2 (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) + \\
 & ((-c_{22} - c_{22}^2 - c_{22} c_{78} + c_{22} c_{81} + c_{22} c_{86} + c_{22} T_1 + c_{22}^2 T_1 + c_{22} c_{56} T_1 + c_{22} c_{69} T_1 + c_{22} c_{78} T_1 - \\
 & c_{22} c_{81} T_1 - c_{22} c_{86} T_1 - c_{22} c_{56} T_1^2 - c_{22} c_{69} T_1^2 + c_{22} T_2 + c_{15} c_{22} T_2 + c_{22}^2 T_2 + c_{22} c_{36} T_2 + \\
 & c_{22} c_{78} T_2 - c_{22} c_{81} T_2 - c_{22} c_{86} T_2 + 3 c_{22} T_1 T_2 - 2 c_{15} c_{22} T_1 T_2 - c_{22} c_{36} T_1 T_2 - \\
 & 2 c_{22} c_{56} T_1 T_2 - c_{22} c_{69} T_1 T_2 - c_{22} c_{78} T_1 T_2 - c_{22} c_{81} T_1 T_2 - 4 c_{22} T_1^2 T_2 + c_{15} c_{22} T_1^2 T_2 - \\
 & c_{22}^2 T_1^2 T_2 + c_{22} c_{56} T_1^2 T_2 + 2 c_{22} c_{81} T_1^2 T_2 + c_{22} c_{86} T_1^2 T_2 + c_{22} c_{56} T_1^3 T_2 + c_{22} c_{69} T_1^3 T_2 - \\
 & c_{15} c_{22} T_2^2 - c_{22} c_{36} T_2^2 - 4 c_{22} T_1 T_2^2 + c_{15} c_{22} T_1 T_2^2 - c_{22}^2 T_1 T_2^2 + c_{22} c_{56} T_1 T_2^2 + 2 c_{22} c_{81} T_1 T_2^2 + \\
 & c_{22} c_{86} T_1 T_2^2 + c_{22} T_1^2 T_2^2 + c_{15} c_{22} T_1^2 T_2^2 + c_{22}^2 T_1^2 T_2^2 + c_{22} c_{36} T_1^2 T_2^2 + c_{22} c_{56} T_1^2 T_2^2 + c_{22} c_{69} T_1^2 T_2^2 - \\
 & c_{22} c_{81} T_1^2 T_2^2 - c_{22} c_{86} T_1^2 T_2^2 + 3 c_{22} T_1^3 T_2^2 - c_{15} c_{22} T_1^3 T_2^2 - 2 c_{22} c_{56} T_1^3 T_2^2 - c_{22} c_{69} T_1^3 T_2^2 - \\
 & c_{22} c_{81} T_1^3 T_2^2 + c_{15} c_{22} T_1 T_2^3 + c_{22} c_{36} T_1 T_2^3 + 3 c_{22} T_1^2 T_2^3 - 2 c_{15} c_{22} T_1^2 T_2^3 - c_{22} c_{36} T_1^2 T_2^3 - \\
 & c_{22} c_{56} T_1^2 T_2^3 - c_{22} c_{81} T_1^2 T_2^3 - 3 c_{22} T_1^3 T_2^3 + c_{15} c_{22} T_1^3 T_2^3 + c_{22} c_{56} T_1^3 T_2^3 + c_{22} c_{81} T_1^3 T_2^3 - \\
 & c_{81} \alpha_4 - c_{86} \alpha_4 + c_{22} T_1 \alpha_4 - c_{56} T_1 \alpha_4 - c_{69} T_1 \alpha_4 - T_2 \alpha_4 - c_{15} T_2 \alpha_4 - c_{22} T_2 \alpha_4 - c_{36} T_2 \alpha_4 - \\
 & c_{78} T_2 \alpha_4 + c_{81} T_2 \alpha_4 + c_{86} T_2 \alpha_4 - 2 T_1 T_2 \alpha_4 + c_{15} T_1 T_2 \alpha_4 + 2 c_{56} T_1 T_2 \alpha_4 + c_{69} T_1 T_2 \alpha_4 + \\
 & c_{78} T_1 T_2 \alpha_4 + 2 c_{81} T_1 T_2 \alpha_4 + c_{86} T_1 T_2 \alpha_4 - c_{22} T_1^2 T_2 \alpha_4 + c_{56} T_1^2 T_2 \alpha_4 + c_{69} T_1^2 T_2 \alpha_4 + \\
 & c_{15} T_2^2 \alpha_4 + c_{36} T_2^2 \alpha_4 + 4 T_1 T_2^2 \alpha_4 + c_{22} T_1 T_2^2 \alpha_4 + c_{36} T_1 T_2^2 \alpha_4 - c_{56} T_1 T_2^2 \alpha_4 - 2 c_{81} T_1 T_2^2 \alpha_4 - \\
 & c_{86} T_1 T_2^2 \alpha_4 + 2 T_1^2 T_2^2 \alpha_4 - c_{15} T_1^2 T_2^2 \alpha_4 - 2 c_{56} T_1^2 T_2^2 \alpha_4 - c_{69} T_1^2 T_2^2 \alpha_4 - c_{81} T_1^2 T_2^2 \alpha_4 - \\
 & c_{15} T_1 T_2^3 \alpha_4 - c_{36} T_1 T_2^3 \alpha_4 - 3 T_1^2 T_2^3 \alpha_4 + c_{15} T_1^2 T_2^3 \alpha_4 + c_{56} T_1^2 T_2^3 \alpha_4 + c_{81} T_1^2 T_2^3 \alpha_4 + \alpha_4^2 - T_1 T_2 \alpha_4^2) \\
 & p_{3,i} p_{3,j} x_{3,i}^2 / ((-1 + T_1) T_1 T_2 (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) - \\
 & ((-1 + T_1 T_2) (-c_{22} - c_{22}^2 - 2 c_{22} c_{78} + c_{22} c_{81} + c_{22} c_{86} + c_{22} T_1 + c_{22}^2 T_1 + c_{22} c_{56} T_1 + \\
 & c_{22} c_{69} T_1 + 2 c_{22} c_{78} T_1 - c_{22} c_{81} T_1 - c_{22} c_{86} T_1 - c_{22} c_{56} T_1^2 - c_{22} c_{69} T_1^2 + c_{22} T_2 + \\
 & c_{15} c_{22} T_2 + c_{22}^2 T_2 + c_{22} c_{36} T_2 + 2 c_{22} c_{78} T_2 - c_{22} c_{81} T_2 - c_{22} c_{86} T_2 + 4 c_{22} T_1 T_2 - \\
 & 2 c_{15} c_{22} T_1 T_2 + c_{22}^2 T_1 T_2 - c_{22} c_{36} T_1 T_2 - 2 c_{22} c_{56} T_1 T_2 - c_{22} c_{69} T_1 T_2 - 2 c_{22} c_{78} T_1 T_2 - \\
 & 2 c_{22} c_{81} T_1 T_2 - c_{22} c_{86} T_1 T_2 - 5 c_{22} T_1^2 T_2 + c_{15} c_{22} T_1^2 T_2 - 2 c_{22}^2 T_1^2 T_2 - c_{22} c_{69} T_1^2 T_2 + \\
 & 3 c_{22} c_{81} T_1^2 T_2 + 2 c_{22} c_{86} T_1^2 T_2 + 2 c_{22} c_{56} T_1^3 T_2 + 2 c_{22} c_{69} T_1^3 T_2 - c_{15} c_{22} T_2^2 - c_{22} c_{36} T_2^2 - \\
 & 5 c_{22} T_1 T_2^2 - 2 c_{22}^2 T_1 T_2^2 - c_{22} c_{36} T_1 T_2^2 + c_{22} c_{56} T_1 T_2^2 + 3 c_{22} c_{81} T_1 T_2^2 + 2 c_{22} c_{86} T_1 T_2^2 - \\
 & c_{22} T_1^2 T_2^2 + 3 c_{15} c_{22} T_1^2 T_2^2 + 2 c_{22}^2 T_1^2 T_2^2 + 2 c_{22} c_{36} T_1^2 T_2^2 + 3 c_{22} c_{56} T_1^2 T_2^2 + 2 c_{22} c_{69} T_1^2 T_2^2 - \\
 & c_{22} c_{81} T_1^2 T_2^2 - 2 c_{22} c_{86} T_1^2 T_2^2 + 6 c_{22} T_1^3 T_2^2 - 2 c_{15} c_{22} T_1^3 T_2^2 - 4 c_{22} c_{56} T_1^3 T_2^2 - 2 c_{22} c_{69} T_1^3 T_2^2 - \\
 & 2 c_{22} c_{81} T_1^3 T_2^2 + 2 c_{15} c_{22} T_1 T_2^3 + 2 c_{22} c_{36} T_1 T_2^3 + 6 c_{22} T_1^2 T_2^3 - 4 c_{15} c_{22} T_1^2 T_2^3 - \\
 & 2 c_{22} c_{36} T_1^2 T_2^3 - 2 c_{22} c_{56} T_1^2 T_2^3 - 2 c_{22} c_{81} T_1^2 T_2^3 - 6 c_{22} T_1^3 T_2^3 + 2 c_{15} c_{22} T_1^3 T_2^3 + \\
 & 2 c_{22} c_{56} T_1^3 T_2^3 + 2 c_{22} c_{81} T_1^3 T_2^3 - c_{81} \alpha_4 - c_{86} \alpha_4 + c_{22} T_1 \alpha_4 - c_{56} T_1 \alpha_4 - c_{69} T_1 \alpha_4 - \\
 & T_2 \alpha_4 - c_{15} T_2 \alpha_4 - c_{22} T_2 \alpha_4 - c_{36} T_2 \alpha_4 - 2 c_{78} T_2 \alpha_4 + c_{81} T_2 \alpha_4 + c_{86} T_2 \alpha_4 - 2 T_1 T_2 \alpha_4 + \\
 & c_{15} T_1 T_2 \alpha_4 + 2 c_{56} T_1 T_2 \alpha_4 + c_{69} T_1 T_2 \alpha_4 + 2 c_{78} T_1 T_2 \alpha_4 + 3 c_{81} T_1 T_2 \alpha_4 + 2 c_{86} T_1 T_2 \alpha_4 - \\
 & 2 c_{22} T_1^2 T_2 \alpha_4 + 2 c_{56} T_1^2 T_2 \alpha_4 + 2 c_{69} T_1^2 T_2 \alpha_4 + c_{15} T_2^2 \alpha_4 + c_{36} T_2^2 \alpha_4 + 5 T_1 T_2^2 \alpha_4 + \\
 & c_{15} T_1 T_2^2 \alpha_4 + 2 c_{22} T_1 T_2^2 \alpha_4 + 2 c_{36} T_1 T_2^2 \alpha_4 - c_{56} T_1 T_2^2 \alpha_4 - 3 c_{81} T_1 T_2^2 \alpha_4 - 2 c_{86} T_1 T_2^2 \alpha_4 +
 \end{aligned}$$

$$\begin{aligned}
 & 4 T_1^2 T_2^2 \alpha_4 - 2 c_{15} T_1^2 T_2^2 \alpha_4 - 4 c_{56} T_1^2 T_2^2 \alpha_4 - 2 c_{69} T_1^2 T_2^2 \alpha_4 - 2 c_{81} T_1^2 T_2^2 \alpha_4 - 2 c_{15} T_1 T_2^3 \alpha_4 - \\
 & 2 c_{36} T_1 T_2^3 \alpha_4 - 6 T_1^2 T_2^3 \alpha_4 + 2 c_{15} T_1^2 T_2^3 \alpha_4 + 2 c_{56} T_1^2 T_2^3 \alpha_4 + 2 c_{81} T_1^2 T_2^3 \alpha_4 + \alpha_4^2 - 2 T_1 T_2 \alpha_4^2) \\
 & p_{3,j}^2 x_{3,i} / (2 (-1 + T_1) T_1^2 T_2^2 (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) + \\
 & \frac{(-c_{56} T_1 - c_{69} T_1 - c_{15} T_2 - c_{36} T_2 - 3 T_1 T_2 + c_{15} T_1 T_2 + c_{56} T_1 T_2 + c_{81} T_1 T_2) p_{3,j} x_{3,j}}{T_1 T_2} \\
 & ((-c_{13} c_{22} + c_{22} c_{32} + c_{13} c_{22} T_1 - c_{22} c_{81} T_1 - c_{22} c_{86} T_1 + c_{22}^2 T_1^2 - c_{22} c_{56} T_1^2 - c_{22} c_{69} T_1^2 + c_{13} c_{22} T_2 - \\
 & c_{22} c_{32} T_2 - c_{13} c_{22} T_1 T_2 - c_{15} c_{22} T_1 T_2 - c_{22} c_{32} T_1 T_2 - c_{22} c_{36} T_1 T_2 + c_{22} c_{81} T_1 T_2 + \\
 & c_{22} c_{86} T_1 T_2 - 3 c_{22} T_1^2 T_2 + c_{15} c_{22} T_1^2 T_2 - 2 c_{22}^2 T_1^2 T_2 + 2 c_{22} c_{56} T_1^2 T_2 + c_{22} c_{69} T_1^2 T_2 + \\
 & 2 c_{22} c_{81} T_1^2 T_2 + c_{22} c_{86} T_1^2 T_2 + c_{22} c_{56} T_1^3 T_2 + c_{22} c_{69} T_1^3 T_2 + c_{15} c_{22} T_1 T_2^2 + c_{22} c_{32} T_1 T_2^2 + \\
 & c_{22} c_{36} T_1 T_2^2 + 3 c_{22} T_1^2 T_2^2 + c_{22}^2 T_1^2 T_2^2 + c_{22} c_{36} T_1^2 T_2^2 - c_{22} c_{56} T_1^2 T_2^2 - 2 c_{22} c_{81} T_1^2 T_2^2 - \\
 & c_{22} c_{86} T_1^2 T_2^2 + 3 c_{22} T_1^3 T_2^2 - c_{15} c_{22} T_1^3 T_2^2 - 2 c_{22} c_{56} T_1^3 T_2^2 - c_{22} c_{69} T_1^3 T_2^2 - c_{22} c_{81} T_1^3 T_2^2 - \\
 & c_{15} c_{22} T_1^2 T_2^3 - c_{22} c_{36} T_1^2 T_2^3 - 3 c_{22} T_1^3 T_2^3 + c_{15} c_{22} T_1^3 T_2^3 + c_{22} c_{56} T_1^3 T_2^3 + c_{22} c_{81} T_1^3 T_2^3 - \\
 & c_{81} \alpha_4 - c_{86} \alpha_4 + 2 c_{22} T_1 \alpha_4 - c_{56} T_1 \alpha_4 - c_{69} T_1 \alpha_4 - c_{13} T_2 \alpha_4 - c_{15} T_2 \alpha_4 + c_{32} T_2 \alpha_4 - \\
 & c_{36} T_2 \alpha_4 - 3 T_1 T_2 \alpha_4 + c_{13} T_1 T_2 \alpha_4 + c_{15} T_1 T_2 \alpha_4 - 2 c_{22} T_1 T_2 \alpha_4 + c_{56} T_1 T_2 \alpha_4 + \\
 & 2 c_{81} T_1 T_2 \alpha_4 + c_{86} T_1 T_2 \alpha_4 + c_{56} T_1^2 T_2 \alpha_4 + c_{69} T_1^2 T_2 \alpha_4 + c_{15} T_1 T_2^2 \alpha_4 - c_{32} T_1 T_2^2 \alpha_4 + \\
 & c_{36} T_1 T_2^2 \alpha_4 + 3 T_1^2 T_2^2 \alpha_4 - c_{15} T_1^2 T_2^2 \alpha_4 - c_{56} T_1^2 T_2^2 \alpha_4 - c_{81} T_1^2 T_2^2 \alpha_4 + \alpha_4^2) p_{1,i} p_{3,j} x_{1,i} x_{3,j}) / \\
 & \frac{1}{(-1 + T_1) (-1 + T_1 T_2) (-c_{22} + c_{22} T_2 - T_2 \alpha_4)} + \frac{1}{T_1 (-c_{22} + c_{22} T_2 - T_2 \alpha_4)} \\
 & (-c_{22} c_{32} - c_{22}^2 T_1 + c_{22} c_{81} T_1 + c_{22} c_{86} T_1 + c_{22} c_{56} T_1^2 + c_{22} c_{69} T_1^2 + \\
 & c_{22} c_{32} T_2 + c_{15} c_{22} T_1 T_2 + c_{22}^2 T_1 T_2 + c_{22} c_{36} T_1 T_2 - c_{22} c_{81} T_1 T_2 - \\
 & c_{22} c_{86} T_1 T_2 + 3 c_{22} T_1^2 T_2 - c_{15} c_{22} T_1^2 T_2 - 2 c_{22} c_{56} T_1^2 T_2 - \\
 & c_{22} c_{69} T_1^2 T_2 - c_{22} c_{81} T_1^2 T_2 - c_{15} c_{22} T_1 T_2^2 - c_{22} c_{36} T_1 T_2^2 - 3 c_{22} T_1^2 T_2^2 + \\
 & c_{15} c_{22} T_1^2 T_2^2 + c_{22} c_{56} T_1^2 T_2^2 + c_{22} c_{81} T_1^2 T_2^2 + c_{81} \alpha_4 + c_{86} \alpha_4 - c_{22} T_1 \alpha_4 + \\
 & c_{56} T_1 \alpha_4 + c_{69} T_1 \alpha_4 + c_{15} T_2 \alpha_4 - c_{32} T_2 \alpha_4 + c_{36} T_2 \alpha_4 + 3 T_1 T_2 \alpha_4 - \\
 & c_{15} T_1 T_2 \alpha_4 - c_{56} T_1 T_2 \alpha_4 - c_{81} T_1 T_2 \alpha_4 - \alpha_4^2) p_{1,j} p_{3,j} x_{1,i} x_{3,j} + \\
 & \frac{(-c_{22} - c_{54} + c_{65} + c_{22} T_2 + c_{54} T_2 - c_{65} T_1 T_2 - T_2 \alpha_4) p_{2,i} p_{3,j} x_{2,i} x_{3,j}}{(-1 + T_2) (-1 + T_1 T_2)} + \\
 & ((-c_{22}^2 + c_{22} c_{65} + c_{22}^2 T_1 - c_{22} c_{65} T_1 + 2 c_{22}^2 T_2 - c_{22} c_{65} T_2 - c_{22} c_{81} T_2 - c_{22} c_{86} T_2 - 2 c_{22}^2 T_1 T_2 - \\
 & c_{22} c_{56} T_1 T_2 + c_{22} c_{65} T_1 T_2 - c_{22} c_{69} T_1 T_2 + c_{22} c_{81} T_1 T_2 + c_{22} c_{86} T_1 T_2 + c_{22} c_{56} T_1^2 T_2 + \\
 & c_{22} c_{69} T_1^2 T_2 - c_{15} c_{22} T_2^2 - c_{22}^2 T_2^2 - c_{22} c_{36} T_2^2 + c_{22} c_{81} T_2^2 + c_{22} c_{86} T_2^2 - 3 c_{22} T_1 T_2^2 + \\
 & 2 c_{15} c_{22} T_1 T_2^2 + c_{22}^2 T_1 T_2^2 + c_{22} c_{36} T_1 T_2^2 + 2 c_{22} c_{56} T_1 T_2^2 + c_{22} c_{69} T_1 T_2^2 - c_{22} c_{86} T_1 T_2^2 + \\
 & 3 c_{22} T_1^2 T_2^2 - c_{15} c_{22} T_1^2 T_2^2 - 2 c_{22} c_{56} T_1^2 T_2^2 - c_{22} c_{69} T_1^2 T_2^2 - c_{22} c_{81} T_1^2 T_2^2 + c_{15} c_{22} T_2^3 + \\
 & c_{22} c_{36} T_2^3 + 3 c_{22} T_1 T_2^3 - 2 c_{15} c_{22} T_1 T_2^3 - c_{22} c_{36} T_1 T_2^3 - c_{22} c_{56} T_1 T_2^3 - c_{22} c_{81} T_1 T_2^3 - \\
 & 3 c_{22} T_1^2 T_2^3 + c_{15} c_{22} T_1^2 T_2^3 + c_{22} c_{56} T_1^2 T_2^3 + c_{22} c_{81} T_1^2 T_2^3 - c_{22} T_2 \alpha_4 + c_{65} T_2 \alpha_4 + c_{81} T_2 \alpha_4 + \\
 & c_{86} T_2 \alpha_4 + c_{56} T_1 T_2 \alpha_4 - c_{65} T_1 T_2 \alpha_4 + c_{69} T_1 T_2 \alpha_4 + c_{15} T_2^2 \alpha_4 + c_{22} T_2^2 \alpha_4 + c_{36} T_2^2 \alpha_4 - \\
 & c_{81} T_2^2 \alpha_4 - c_{86} T_2^2 \alpha_4 + 3 T_1 T_2^2 \alpha_4 - c_{15} T_1 T_2^2 \alpha_4 - 2 c_{56} T_1 T_2^2 \alpha_4 - c_{69} T_1 T_2^2 \alpha_4 - c_{81} T_1 T_2^2 \alpha_4 - \\
 & c_{15} T_2^3 \alpha_4 - c_{36} T_2^3 \alpha_4 - 3 T_1 T_2^3 \alpha_4 + c_{15} T_1 T_2^3 \alpha_4 + c_{56} T_1 T_2^3 \alpha_4 + c_{81} T_1 T_2^3 \alpha_4 - T_2 \alpha_4^2) \\
 & p_{2,j} p_{3,j} x_{2,i} x_{3,j}) / ((-1 + T_1) T_2 (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) + \\
 & ((c_{22} + c_{22}^2 - c_{22} c_{81} - c_{22} c_{86} - c_{22} T_1 - c_{22}^2 T_1 - c_{22} c_{56} T_1 - c_{22} c_{69} T_1 + c_{22} c_{81} T_1 + c_{22} c_{86} T_1 + \\
 & c_{22} c_{56} T_1^2 + c_{22} c_{69} T_1^2 - c_{22} T_2 - c_{15} c_{22} T_2 - c_{22}^2 T_2 - c_{22} c_{36} T_2 + c_{22} c_{81} T_2 + c_{22} c_{86} T_2 - \\
 & 2 c_{22} T_1 T_2 + 2 c_{15} c_{22} T_1 T_2 + c_{22}^2 T_1 T_2 + c_{22} c_{36} T_1 T_2 + 2 c_{22} c_{56} T_1 T_2 + c_{22} c_{69} T_1 T_2 - \\
 & c_{22} c_{86} T_1 T_2 + 3 c_{22} T_1^2 T_2 - c_{15} c_{22} T_1^2 T_2 - 2 c_{22} c_{56} T_1^2 T_2 - c_{22} c_{69} T_1^2 T_2 - c_{22} c_{81} T_1^2 T_2 + \\
 & c_{15} c_{22} T_2^2 + c_{22} c_{36} T_2^2 + 3 c_{22} T_1 T_2^2 - 2 c_{15} c_{22} T_1 T_2^2 - c_{22} c_{36} T_1 T_2^2 - c_{22} c_{56} T_1 T_2^2 - \\
 & c_{22} c_{81} T_1 T_2^2 - 3 c_{22} T_1^2 T_2^2 + c_{15} c_{22} T_1^2 T_2^2 + c_{22} c_{56} T_1^2 T_2^2 + c_{22} c_{81} T_1^2 T_2^2 + c_{81} \alpha_4 + c_{86} \alpha_4 -
 \end{aligned}$$

$$\begin{aligned}
& c_{22} T_1 \alpha_4 + c_{56} T_1 \alpha_4 + c_{69} T_1 \alpha_4 + T_2 \alpha_4 + c_{15} T_2 \alpha_4 + c_{22} T_2 \alpha_4 + c_{36} T_2 \alpha_4 - c_{81} T_2 \alpha_4 - \\
& c_{86} T_2 \alpha_4 + 2 T_1 T_2 \alpha_4 - c_{15} T_1 T_2 \alpha_4 - 2 c_{56} T_1 T_2 \alpha_4 - c_{69} T_1 T_2 \alpha_4 - c_{81} T_1 T_2 \alpha_4 - \\
& c_{15} T_2^2 \alpha_4 - c_{36} T_2^2 \alpha_4 - 3 T_1 T_2^2 \alpha_4 + c_{15} T_1 T_2^2 \alpha_4 + c_{56} T_1 T_2^2 \alpha_4 + c_{81} T_1 T_2^2 \alpha_4 - \alpha_4^2) \\
& p_{3,i} p_{3,j} x_{3,i} x_{3,j} \Big/ \left((-1 + T_1) (-c_{22} + c_{22} T_2 - T_2 \alpha_4) \right) - \\
& \left((-c_{22} - c_{22}^2 - 2 c_{22} c_{78} + c_{22} c_{81} + c_{22} c_{86} + c_{22} T_1 + c_{22}^2 T_1 + c_{22} c_{56} T_1 + c_{22} c_{69} T_1 + \right. \\
& 2 c_{22} c_{78} T_1 - c_{22} c_{81} T_1 - c_{22} c_{86} T_1 - c_{22} c_{56} T_1^2 - c_{22} c_{69} T_1^2 + c_{22} T_2 + c_{15} c_{22} T_2 + \\
& c_{22}^2 T_2 + c_{22} c_{36} T_2 + 2 c_{22} c_{78} T_2 - c_{22} c_{81} T_2 - c_{22} c_{86} T_2 + 5 c_{22} T_1 T_2 - 2 c_{15} c_{22} T_1 T_2 + \\
& 2 c_{22}^2 T_1 T_2 - c_{22} c_{36} T_1 T_2 - 2 c_{22} c_{56} T_1 T_2 - c_{22} c_{69} T_1 T_2 - 2 c_{22} c_{78} T_1 T_2 - 3 c_{22} c_{81} T_1 T_2 - \\
& 2 c_{22} c_{86} T_1 T_2 - 6 c_{22} T_1^2 T_2 + c_{15} c_{22} T_1^2 T_2 - 3 c_{22}^2 T_1^2 T_2 - c_{22} c_{56} T_1^2 T_2 - 2 c_{22} c_{69} T_1^2 T_2 + \\
& 4 c_{22} c_{81} T_1^2 T_2 + 3 c_{22} c_{86} T_1^2 T_2 + 3 c_{22} c_{56} T_1^3 T_2 + 3 c_{22} c_{69} T_1^3 T_2 - c_{15} c_{22} T_2^2 - c_{22} c_{36} T_2^2 - \\
& 6 c_{22} T_1 T_2^2 - c_{15} c_{22} T_1 T_2^2 - 3 c_{22}^2 T_1 T_2^2 - 2 c_{22} c_{36} T_1 T_2^2 + c_{22} c_{56} T_1 T_2^2 + 4 c_{22} c_{81} T_1 T_2^2 + \\
& 3 c_{22} c_{86} T_1 T_2^2 - 3 c_{22} T_1^2 T_2^2 + 5 c_{15} c_{22} T_1^2 T_2^2 + 3 c_{22}^2 T_1^2 T_2^2 + 3 c_{22} c_{36} T_1^2 T_2^2 + 5 c_{22} c_{56} T_1^2 T_2^2 + \\
& 3 c_{22} c_{69} T_1^2 T_2^2 - c_{22} c_{81} T_1^2 T_2^2 - 3 c_{22} c_{86} T_1^2 T_2^2 + 9 c_{22} T_1^3 T_2^2 - 3 c_{15} c_{22} T_1^3 T_2^2 - 6 c_{22} c_{56} T_1^3 T_2^2 - \\
& 3 c_{22} c_{69} T_1^3 T_2^2 - 3 c_{22} c_{81} T_1^3 T_2^2 + 3 c_{15} c_{22} T_1 T_2^3 + 3 c_{22} c_{36} T_1 T_2^3 + 9 c_{22} T_1^2 T_2^3 - 6 c_{15} c_{22} T_1^2 T_2^3 - \\
& 3 c_{22} c_{36} T_1^2 T_2^3 - 3 c_{22} c_{56} T_1^2 T_2^3 - 3 c_{22} c_{81} T_1^2 T_2^3 - 9 c_{22} T_1^3 T_2^3 + 3 c_{15} c_{22} T_1^3 T_2^3 + 3 c_{22} c_{56} T_1^3 T_2^3 + \\
& 3 c_{22} c_{81} T_1^3 T_2^3 - c_{81} \alpha_4 - c_{86} \alpha_4 + c_{22} T_1 \alpha_4 - c_{56} T_1 \alpha_4 - c_{69} T_1 \alpha_4 - T_2 \alpha_4 - c_{15} T_2 \alpha_4 - \\
& c_{22} T_2 \alpha_4 - c_{36} T_2 \alpha_4 - 2 c_{78} T_2 \alpha_4 + c_{81} T_2 \alpha_4 + c_{86} T_2 \alpha_4 - 2 T_1 T_2 \alpha_4 + c_{15} T_1 T_2 \alpha_4 + \\
& 2 c_{56} T_1 T_2 \alpha_4 + c_{69} T_1 T_2 \alpha_4 + 2 c_{78} T_1 T_2 \alpha_4 + 4 c_{81} T_1 T_2 \alpha_4 + 3 c_{86} T_1 T_2 \alpha_4 - 3 c_{22} T_1^2 T_2 \alpha_4 + \\
& 3 c_{56} T_1^2 T_2 \alpha_4 + 3 c_{69} T_1^2 T_2 \alpha_4 + c_{15} T_2^2 \alpha_4 + c_{36} T_2^2 \alpha_4 + 6 T_1 T_2^2 \alpha_4 + 2 c_{15} T_1 T_2^2 \alpha_4 + \\
& 3 c_{22} T_1 T_2^2 \alpha_4 + 3 c_{36} T_1 T_2^2 \alpha_4 - c_{56} T_1 T_2^2 \alpha_4 - 4 c_{81} T_1 T_2^2 \alpha_4 - 3 c_{86} T_1 T_2^2 \alpha_4 + 6 T_1^2 T_2^2 \alpha_4 - \\
& 3 c_{15} T_1^2 T_2^2 \alpha_4 - 6 c_{56} T_1^2 T_2^2 \alpha_4 - 3 c_{69} T_1^2 T_2^2 \alpha_4 - 3 c_{81} T_1^2 T_2^2 \alpha_4 - 3 c_{15} T_1 T_2^3 \alpha_4 - 3 c_{36} T_1 T_2^3 \alpha_4 - \\
& 9 T_1^2 T_2^3 \alpha_4 + 3 c_{15} T_1^2 T_2^3 \alpha_4 + 3 c_{56} T_1^2 T_2^3 \alpha_4 + 3 c_{81} T_1^2 T_2^3 \alpha_4 + \alpha_4^2 - 3 T_1 T_2 \alpha_4^2) p_{3,j}^2 x_{3,i} x_{3,j} \Big/ \\
& (2 (-1 + T_1) T_1 T_2 (-c_{22} + c_{22} T_2 - T_2 \alpha_4)) / \cdot \alpha_4 \rightarrow z
\end{aligned}$$

```
In[ ]:= {p*, x*, pi*, xi*} = {pi, xi, p, x}; (u_i_*) := (u*) i;
```

```
In[ ]:= Zip_{i}[\mathcal{E}_-] := \mathcal{E};
Zip_{\{\mathcal{E}_-, \mathcal{E}_s\}}[\mathcal{E}_-] := (Collect[\mathcal{E} // Zip_{\{\mathcal{E}_s\}}, \mathcal{S}] / \cdot f_{-} \cdot \mathcal{S}^{d_{-}} \Rightarrow (D[f, \{\mathcal{S}^*, d\}])) / \cdot \mathcal{S}^* \rightarrow 0
```

```
In[ ]:= px2g[\mathcal{E}_-] := Module[{ps, xs, Q},
  ps = Union[Cases[\mathcal{E}, p_, \infty]];
  xs = Union[Cases[\mathcal{E}, x_, \infty]];
  Q = Sum[p0* x0* g_{p0[2], x0[2], p0[3], x0[3]}, {p0, ps}, {x0, xs}];
  Expand[Zip_{ps \cup xs}[\mathcal{E} e^Q] / \cdot g_{\alpha, \beta, i, j} \Rightarrow If[\alpha == \beta, g_{\alpha, i, j}, 0]]
]
```

The simplifying substitutions:

```
In[ ]:= EasySubs = {C4|10|13|15|22|28|32|36|49|54|56|65|69|69|78|81|86 \rightarrow 0, B \rightarrow 1};
(* {Z \rightarrow 0, C15 \rightarrow 0, C22 \rightarrow 0, C36 \rightarrow 0, C56 \rightarrow 0, C69 \rightarrow 0, C81 \rightarrow 0, C86 \rightarrow 0} *) ;
```

```
In[*]:= R1[1, i_, j_] := Evaluate [
  Together [ (px2g[r1[1, i, j]] + (Coefficient[r1[1, i, j] /. t : (x | p) ==> lambda t, lambda^3] /.
    x3, alpha p1, beta p2, gamma ==> y alpha, beta, gamma)) /. EasySubs ] /. z -> 0]
R1[-1, i_, j_] := Evaluate [
  Together [ (px2g[r1[-1, i, j]] + (Coefficient[r1[-1, i, j] /. t : (x | p) ==> lambda t, lambda^3] /.
    x3, alpha p1, beta p2, gamma ==> y alpha, beta, gamma)) /. EasySubs ] /. z -> 0]
```

```
In[*]:= theta[1, i_, j_, alpha_, beta_, gamma_] :=
  Evaluate[r0[1, i, j] /. {p3, j ==> g3, alpha, j, x1, i ==> g1, i, beta, x2, i ==> g2, i, gamma} /. EasySubs /. z -> 0];
(* The theta graph with light (pxx) vertex at (1, i, j) and
  unspecified heavy (xpp) vertex *)
theta[-1, i_, j_, alpha_, beta_, gamma_] := Evaluate [
  r0[-1, i, j] /. {p3, j ==> g3, alpha, j, x1, i ==> g1, i, beta, x2, i ==> g2, i, gamma} /. EasySubs /. z -> 0];
(* The theta graph with light (pxx) vertex at (-1, i, j) and
  unspecified heavy (xpp) vertex *)
```

```
In[*]:= T3 = T1 T2;
CF[E_] := Factor@Together[E];
lambda[K_] := Module[{Cs, phi, n, A, s, i, j, k, Delta, G, gEval, Y, yEval, c, lambda1},
  {Cs, phi} = Rot[K]; n = Length[Cs];
  A = IdentityMatrix[2 n + 1];
  Cases[Cs, {s_, i_, j_} ==> (A[[{i, j}, {i + 1, j + 1}]] += ( -T^s T^s - 1 ))];
  Delta = T^(-Total[phi] - Total[Cs[[All, 1]]]) / 2 Det[A];
  G = Inverse[A];
  gEval[E_] := CF[E] /.
    {g1, alpha, beta ==> (G[[alpha, beta]] /. T -> T1),
     g2, alpha, beta ==> (G[[alpha, beta]] /. T -> T2), g3, alpha, beta ==> (G[[alpha, beta]] /. T -> T3)}];
  Y[alpha_, beta_, gamma_] :=
  Y[alpha, beta, gamma] = Sum[{s, i, j} = c; (* The expectation value of x3, alpha p1, beta p2, gamma *)
    theta[s, i, j, alpha, beta, gamma],
    {c, Cs}];
  yEval[E_] := E /. y alpha, beta, gamma ==> Y[alpha, beta, gamma];
  lambda1 = Sum_{k=1}^n R1 @@ Cs[[k]] - Sum_{k=1}^{2^n} phi[[k]] (g1, k, k + g2, k, k + g3, k, k - 3 / 2);
  {Delta, (Delta^2 /. T -> T1) (Delta^2 /. T -> T2) (Delta^2 /. T -> T3) lambda1} // yEval // gEval
];
```

```
In[*]:= ygs = Flatten@Join[Table[ga,b,c, {a, 1, 3}, {b, {i, j}}, {c, {i, j}}],
  Table[ya,b,c, {a, {i, j}}, {b, {i, j}}, {c, {i, j}}]]
ygCF[ $\mathcal{E}$ ] := Total@CoefficientRules[ $\mathcal{E}$ , ygs] /.
  {(u- → x-) ⇒ (Factor@Together[x] × Product[ygs[[w]]u[[w]], {w, 1, Length[ygs]}])}
```

Out[*]=

```
{g1,i,i, g1,i,j, g1,j,i, g1,j,j, g2,i,i, g2,i,j, g2,j,i, g2,j,j, g3,i,i,
  g3,i,j, g3,j,i, g3,j,j, yi,i,i, yi,i,j, yi,j,i, yi,j,j, yj,i,i, yj,i,j, yj,j,i, yj,j,j}
```

```
In[*]:= ygCF[R1[1, i, j]]
```

Out[*]=

$$\begin{aligned}
& -\frac{3}{2} g_{1,i,j} g_{1,j,i} - (-1 + T_1) T_1 g_{1,j,i}^2 - g_{1,i,i} g_{1,j,j} + (1 + T_1) g_{1,j,i} g_{1,j,j} - \frac{3 T_1 (-1 + T_2) g_{1,j,j} g_{2,i,i}}{-1 + T_1} + \\
& \frac{3 T_1 (-1 + T_2) g_{1,i,i} g_{2,j,i}}{-1 + T_1} + 3 T_1 (-1 + 2 T_2) g_{1,j,i} g_{2,j,i} - g_{2,i,j} g_{2,j,i} - (-1 + T_2) T_2 g_{2,j,i}^2 - \\
& 3 T_1 g_{1,j,i} g_{2,j,j} - g_{2,i,i} g_{2,j,j} + (1 + T_2) g_{2,j,i} g_{2,j,j} + \frac{3 T_1 T_2 g_{1,j,j} g_{3,i,i}}{-1 + T_1} + \\
& \frac{3 T_1 (-1 + T_2) g_{2,j,j} g_{3,i,i}}{-1 + T_1} - 3 T_1 (-1 + T_1 T_2) g_{1,j,i} g_{3,j,i} + \frac{3 T_1 (-1 + T_1 T_2) g_{2,i,j} g_{3,j,i}}{-1 + T_1} + \\
& \frac{3 T_1 (-1 + T_2) T_2 (-1 + T_1 T_2) g_{2,j,i} g_{3,j,i}}{-1 + T_1} - \frac{3 T_1 (-1 + T_1 T_2) g_{2,j,j} g_{3,j,i}}{-1 + T_1} - \\
& \frac{(-1 - 2 T_1 + 3 T_1 T_2) g_{3,i,j} g_{3,j,i}}{-1 + T_1} - \frac{T_1 T_2 (-1 + T_1 T_2) (-1 - 2 T_1 + 3 T_1 T_2) g_{3,j,i}^2}{-1 + T_1} + 3 g_{3,j,j} - \\
& \frac{3 T_1 g_{1,i,i} g_{3,j,j}}{-1 + T_1} - \frac{3 T_1 (-1 + T_2) T_2 g_{2,j,i} g_{3,j,j}}{-1 + T_1} - \frac{(-1 - 2 T_1 + 3 T_1 T_2) g_{3,i,i} g_{3,j,j}}{-1 + T_1} + \\
& \frac{(1 + T_1 T_2) (-1 - 2 T_1 + 3 T_1 T_2) g_{3,j,i} g_{3,j,j}}{-1 + T_1} - \frac{3 T_1 (-1 + T_1 T_2) y_{i,j,i}}{-1 + T_1} + \frac{3 T_1 (-1 + T_1 T_2) y_{i,j,j}}{-1 + T_1}
\end{aligned}$$

In[*]:= `ygCF[R1[-1, i, j]]`

Out[*]=

$$\begin{aligned}
& \frac{3}{2} + \frac{2(-1+T_1)g_{1,i,i}g_{1,j,i}}{T_1} + g_{1,i,j}g_{1,j,i} - \frac{(-1+T_1)(-1+2T_1)g_{1,j,i}^2}{T_1^2} + g_{1,i,i}g_{1,j,j} - \\
& \frac{(-1+3T_1)g_{1,j,i}g_{1,j,j}}{T_1} + 3(-1+T_2)g_{1,j,i}g_{2,i,i} + \frac{3T_1(-1+T_2)g_{1,j,j}g_{2,i,i}}{-1+T_1} - \\
& \frac{3T_1(-1+T_2)g_{1,i,i}g_{2,j,i}}{(-1+T_1)T_2} - \frac{3(2-2T_2+T_2^2)g_{1,j,i}g_{2,j,i}}{T_2} - \frac{3T_1(-1+T_2)^2g_{1,j,j}g_{2,j,i}}{(-1+T_1)T_2} + \\
& \frac{2(-1+T_2)g_{2,i,i}g_{2,j,i}}{T_2} + g_{2,i,j}g_{2,j,i} - \frac{(-1+T_2)(-1+2T_2)g_{2,j,i}^2}{T_2^2} + 3g_{1,j,i}g_{2,j,j} + g_{2,i,i}g_{2,j,j} - \\
& \frac{(-1+3T_2)g_{2,j,i}g_{2,j,j}}{T_2} - 3T_2g_{1,j,i}g_{3,i,i} - \frac{3T_1T_2g_{1,j,j}g_{3,i,i}}{-1+T_1} - \frac{3T_1(-1+T_2)^2g_{2,j,i}g_{3,i,i}}{(-1+T_1)T_2} - \\
& \frac{3T_1(-1+T_2)g_{2,j,j}g_{3,i,i}}{-1+T_1} - \frac{3(-1+T_1T_2)g_{3,j,i}}{T_1T_2} + \frac{3(-1+T_1T_2)g_{1,i,i}g_{3,j,i}}{(-1+T_1)T_2} - \\
& \frac{3(-1+T_1T_2)g_{1,j,i}g_{3,j,i}}{T_1T_2} + \frac{3(-1+T_1T_2)g_{1,j,j}g_{3,j,i}}{-1+T_1} - \frac{3(-1+T_2)(-1+T_1T_2)g_{2,i,i}g_{3,j,i}}{(-1+T_1)T_2} - \\
& \frac{3(-1+T_1T_2)g_{2,i,j}g_{3,j,i}}{-1+T_1} + \frac{3(-1+T_2)(-1+2T_2)(-1+T_1T_2)g_{2,j,i}g_{3,j,i}}{(-1+T_1)T_2^2} + \\
& \frac{3(-1+2T_2)(-1+T_1T_2)g_{2,j,j}g_{3,j,i}}{(-1+T_1)T_2} + \frac{2(-1+T_1T_2)(-1-2T_1+3T_1T_2)g_{3,i,i}g_{3,j,i}}{(-1+T_1)T_1T_2} + \\
& \frac{(-1-2T_1+3T_1T_2)g_{3,i,j}g_{3,j,i}}{-1+T_1} - \frac{(-1+T_1T_2)(-1+2T_1T_2)(-1-2T_1+3T_1T_2)g_{3,j,i}^2}{(-1+T_1)T_1^2T_2^2} - 3g_{3,j,j} + \\
& \frac{3T_1g_{1,i,i}g_{3,j,j}}{-1+T_1} - 3g_{1,j,i}g_{3,j,j} + \frac{3T_1(-1+T_2)g_{2,j,i}g_{3,j,j}}{-1+T_1} + \frac{(-1-2T_1+3T_1T_2)g_{3,i,i}g_{3,j,j}}{-1+T_1} - \\
& \frac{(-1+3T_1T_2)(-1-2T_1+3T_1T_2)g_{3,j,i}g_{3,j,j}}{(-1+T_1)T_1T_2} + \frac{3(-1+T_1T_2)y_{i,j,i}}{-1+T_1} - \frac{3(-1+T_1T_2)y_{i,j,j}}{-1+T_1}
\end{aligned}$$

In[*]:= **Timing**[λ [**Knot**[3, 1]]]

Out[*]=

$$\left\{ 0.296875, \left\{ \frac{1 - T + T^2}{T}, \right. \right.$$

$$- \frac{1}{T_1^5 T_2^5} \left(-6 + 15 T_1 - 21 T_1^2 + 15 T_1^3 - 6 T_1^4 + 27 T_2 - 54 T_1 T_2 + 55 T_1^2 T_2 - 8 T_1^3 T_2 - 18 T_1^4 T_2 + 19 T_1^5 T_2 - \right.$$

$$57 T_2^2 + 58 T_1 T_2^2 + 6 T_1^2 T_2^2 - 114 T_1^3 T_2^2 + 68 T_1^4 T_2^2 - 6 T_1^5 T_2^2 - 43 T_1^6 T_2^2 + 78 T_2^3 - 2 T_1 T_2^3 - 84 T_1^2 T_2^3 +$$

$$139 T_1^3 T_2^3 + 84 T_1^4 T_2^3 - 108 T_1^5 T_2^3 + 85 T_1^6 T_2^3 + 55 T_1^7 T_2^3 - 63 T_2^4 - 120 T_1 T_2^4 + 140 T_1^2 T_2^4 - 75 T_1^3 T_2^4 -$$

$$284 T_1^4 T_2^4 + 117 T_1^5 T_2^4 - 54 T_1^6 T_2^4 - 116 T_1^7 T_2^4 - 59 T_1^8 T_2^4 + 33 T_2^5 + 148 T_1 T_2^5 + 36 T_1^2 T_2^5 - 177 T_1^3 T_2^5 +$$

$$417 T_1^4 T_2^5 + 90 T_1^5 T_2^5 - 94 T_1^6 T_2^5 + 197 T_1^7 T_2^5 + 114 T_1^8 T_2^5 + 44 T_1^9 T_2^5 - 6 T_2^6 - 108 T_1 T_2^6 - 136 T_1^2 T_2^6 +$$

$$118 T_1^3 T_2^6 - 132 T_1^4 T_2^6 - 361 T_1^5 T_2^6 + 22 T_1^6 T_2^6 - 21 T_1^7 T_2^6 - 246 T_1^8 T_2^6 - 69 T_1^9 T_2^6 - 24 T_1^{10} T_2^6 + 24 T_1 T_2^7 +$$

$$162 T_1^2 T_2^7 - 20 T_1^3 T_2^7 - 50 T_1^4 T_2^7 + 326 T_1^5 T_2^7 + 102 T_1^6 T_2^7 - 8 T_1^7 T_2^7 + 140 T_1^8 T_2^7 + 148 T_1^9 T_2^7 + 33 T_1^{10} T_2^7 +$$

$$9 T_1^{11} T_2^7 - 45 T_1^2 T_2^8 - 117 T_1^3 T_2^8 + 115 T_1^4 T_2^8 - 99 T_1^5 T_2^8 - 258 T_1^6 T_2^8 + 107 T_1^7 T_2^8 - 114 T_1^8 T_2^8 - 97 T_1^9 T_2^8 -$$

$$48 T_1^{10} T_2^8 - 18 T_1^{11} T_2^8 + 48 T_1^3 T_2^9 + 18 T_1^4 T_2^9 - 61 T_1^5 T_2^9 + 132 T_1^6 T_2^9 + 52 T_1^7 T_2^9 - 64 T_1^8 T_2^9 + 114 T_1^9 T_2^9 +$$

$$3 T_1^{10} T_2^9 + 27 T_1^{11} T_2^9 - 30 T_1^4 T_2^{10} + 36 T_1^5 T_2^{10} - 33 T_1^6 T_2^{10} - 27 T_1^7 T_2^{10} + 21 T_1^8 T_2^{10} - 36 T_1^9 T_2^{10} + 6 T_1^{10} T_2^{10} -$$

$$18 T_1^{11} T_2^{10} + 9 T_1^5 T_2^{11} - 24 T_1^6 T_2^{11} + 45 T_1^7 T_2^{11} - 48 T_1^8 T_2^{11} + 42 T_1^9 T_2^{11} - 21 T_1^{10} T_2^{11} + 9 T_1^{11} T_2^{11} \left. \right) \left. \right\}$$

In[*]:= λ [**Knot**[4, 1]]

Out[*]=

$$\left\{ - \frac{1 - 3 T + T^2}{T}, \right.$$

$$- \frac{1}{T_1^4 T_2^4} \left((1 - 3 T_1 + T_1^2) (-1 + T_1 T_2) (1 - 3 T_2 + T_2^2) (1 - 3 T_1 T_2 + T_1^2 T_2^2) (-9 T_1 + 11 T_1^2 - 3 T_2 + 27 T_1 T_2 - \right.$$

$$15 T_1^2 T_2 - 19 T_1^3 T_2 + 2 T_2^2 - 42 T_1 T_2^2 + 51 T_1^2 T_2^2 + 24 T_1^3 T_2^2 + 24 T_1^4 T_2^2 - 27 T_1^5 T_2^2 + 6 T_1^6 T_2^2 + 32 T_1 T_2^3 -$$


$$27 T_1^2 T_2^3 - 54 T_1^3 T_2^3 - 78 T_1^4 T_2^3 + 30 T_1^5 T_2^3 + 9 T_1^6 T_2^3 - 3 T_1^7 T_2^3 - 15 T_1 T_2^4 - 15 T_1^2 T_2^4 + 96 T_1^3 T_2^4 - 9 T_1^4 T_2^4 +$$

$$144 T_1^5 T_2^4 - 60 T_1^6 T_2^4 + 3 T_1^7 T_2^4 + 3 T_1 T_2^5 + 21 T_1^2 T_2^5 - 75 T_1^3 T_2^5 + 63 T_1^4 T_2^5 - 135 T_1^5 T_2^5 + 9 T_1^6 T_2^5 +$$

$$12 T_1^7 T_2^5 - 6 T_1^2 T_2^6 + 18 T_1^3 T_2^6 - 18 T_1^4 T_2^6 + 21 T_1^5 T_2^6 + 27 T_1^6 T_2^6 - 12 T_1^7 T_2^6 + 3 T_1^5 T_2^7 - 9 T_1^6 T_2^7 + 3 T_1^7 T_2^7 \left. \right) \left. \right\}$$

In[*]:= **Conway** = λ [**Knot**[11, **NonAlternating**, 34]]

 **KnotTheory**: Loading precomputed data in DTCODE4KNOTS TO 11`.

 **KnotTheory**: The GaussCode to PD conversion was written by Siddarth Sankaran at the University of Toronto in the summer of 2005.

Out[\ast]=

$$\left\{ 1, \right. \\ \left. - \frac{1}{T_1^9 T_2^9} \left(9 - 51 T_1 + 153 T_1^2 - 309 T_1^3 + 441 T_1^4 - 462 T_1^5 + 360 T_1^6 - 201 T_1^7 + 72 T_1^8 - 12 T_1^9 - 57 T_2 + 291 T_1 T_2 - \right. \right. \\ \left. \left. 771 T_1^2 T_2 + 1299 T_1^3 T_2 - 1434 T_1^4 T_2 + 924 T_1^5 T_2 - 144 T_1^6 T_2 - 420 T_1^7 T_2 + 507 T_1^8 T_2 - 276 T_1^9 T_2 + \right. \right. \\ \left. \left. 60 T_1^{10} T_2 + 156 T_2^2 - 684 T_1 T_2^2 + 1485 T_1^2 T_2^2 - 1743 T_1^3 T_2^2 + 747 T_1^4 T_2^2 + 1365 T_1^5 T_2^2 - 2571 T_1^6 T_2^2 + \right. \right. \\ \left. \left. 2301 T_1^7 T_2^2 - 960 T_1^8 T_2^2 - 222 T_1^9 T_2^2 + 465 T_1^{10} T_2^2 - 150 T_1^{11} T_2^2 - 264 T_2^3 + 933 T_1 T_2^3 - 1404 T_1^2 T_2^3 - \right. \right. \\ \left. \left. 12 T_1^3 T_2^3 + 3522 T_1^4 T_2^3 - 7788 T_1^5 T_2^3 + 7833 T_1^6 T_2^3 - 5031 T_1^7 T_2^3 + 1341 T_1^8 T_2^3 + 582 T_1^9 T_2^3 - 138 T_1^{10} T_2^3 - \right. \right. \\ \left. \left. 567 T_1^{11} T_2^3 + 270 T_1^{12} T_2^3 + 315 T_2^4 - 759 T_1 T_2^4 + 4770 T_1^2 T_2^4 - 12576 T_1^3 T_2^4 + 20028 T_1^4 T_2^4 - 18207 T_1^5 T_2^4 + \right. \right. \\ \left. \left. 12219 T_1^6 T_2^4 - 5040 T_1^7 T_2^4 + 1137 T_1^8 T_2^4 - 1335 T_1^9 T_2^4 + 1008 T_1^{10} T_2^4 + 390 T_1^{11} T_2^4 - 372 T_1^{12} T_2^4 - 264 T_2^5 + \right. \right. \\ \left. \left. 159 T_1 T_2^5 + 2154 T_1^2 T_2^5 - 10290 T_1^3 T_2^5 + 21117 T_1^4 T_2^5 - 28803 T_1^5 T_2^5 + 22350 T_1^6 T_2^5 - 12285 T_1^7 T_2^5 + \right. \right. \\ \left. \left. 2262 T_1^8 T_2^5 + 2031 T_1^9 T_2^5 - 123 T_1^{10} T_2^5 + 915 T_1^{11} T_2^5 - 1800 T_1^{12} T_2^5 + 93 T_1^{13} T_2^5 + 396 T_1^{14} T_2^5 + 168 T_2^6 + \right. \right. \\ \left. \left. 345 T_1 T_2^6 - 3204 T_1^2 T_2^6 + 11898 T_1^3 T_2^6 - 20901 T_1^4 T_2^6 + 24255 T_1^5 T_2^6 - 15004 T_1^6 T_2^6 + 7644 T_1^7 T_2^6 - \right. \right. \\ \left. \left. 2994 T_1^8 T_2^6 + 1532 T_1^9 T_2^6 - 3489 T_1^{10} T_2^6 - 1017 T_1^{11} T_2^6 + 1218 T_1^{12} T_2^6 + 1512 T_1^{13} T_2^6 - 567 T_1^{14} T_2^6 - \right. \right. \\ \left. \left. 330 T_1^{15} T_2^6 - 66 T_2^7 - 624 T_1 T_2^7 + 2955 T_1^2 T_2^7 - 8895 T_1^3 T_2^7 + 11448 T_1^4 T_2^7 - 8934 T_1^5 T_2^7 + 3828 T_1^6 T_2^7 - \right. \right. \\ \left. \left. 5686 T_1^7 T_2^7 + 7299 T_1^8 T_2^7 - 97 T_1^9 T_2^7 - 4620 T_1^{10} T_2^7 + 10611 T_1^{11} T_2^7 - 3600 T_1^{12} T_2^7 - 1611 T_1^{13} T_2^7 - \right. \right. \\ \left. \left. 591 T_1^{14} T_2^7 + 759 T_1^{15} T_2^7 + 216 T_1^{16} T_2^7 + 12 T_2^8 + 423 T_1 T_2^8 - 882 T_1^2 T_2^8 + 1665 T_1^3 T_2^8 + 1560 T_1^4 T_2^8 - \right. \right. \\ \left. \left. 2571 T_1^5 T_2^8 - 5670 T_1^6 T_2^8 + 13596 T_1^7 T_2^8 - 8836 T_1^8 T_2^8 - 15166 T_1^9 T_2^8 + 21465 T_1^{10} T_2^8 - 16239 T_1^{11} T_2^8 - \right. \right. \\ \left. \left. 1218 T_1^{12} T_2^8 + 4203 T_1^{13} T_2^8 + 1071 T_1^{14} T_2^8 - 288 T_1^{15} T_2^8 - 645 T_1^{16} T_2^8 - 108 T_1^{17} T_2^8 - 132 T_1 T_2^9 - 321 T_1^2 T_2^9 + \right. \right. \\ \left. \left. 396 T_1^3 T_2^9 - 27 T_1^4 T_2^9 - 7542 T_1^5 T_2^9 + 20291 T_1^6 T_2^9 - 12505 T_1^7 T_2^9 - 12103 T_1^8 T_2^9 + 43137 T_1^9 T_2^9 - \right. \right. \\ \left. \left. 31216 T_1^{10} T_2^9 + 9521 T_1^{11} T_2^9 + 7538 T_1^{12} T_2^9 - 2373 T_1^{13} T_2^9 - 3573 T_1^{14} T_2^9 + 81 T_1^{15} T_2^9 + 570 T_1^{16} T_2^9 + \right. \right. \\ \left. \left. 408 T_1^{17} T_2^9 + 36 T_1^{18} T_2^9 + 12 T_1 T_2^{10} + 300 T_1^2 T_2^{10} + 339 T_1^3 T_2^{10} - 2082 T_1^4 T_2^{10} + 5733 T_1^5 T_2^{10} - 3579 T_1^6 T_2^{10} - \right. \right. \\ \left. \left. 21882 T_1^7 T_2^{10} + 44004 T_1^8 T_2^{10} - 50950 T_1^9 T_2^{10} + 15629 T_1^{10} T_2^{10} + 4635 T_1^{11} T_2^{10} - 7188 T_1^{12} T_2^{10} - \right. \right. \\ \left. \left. 3372 T_1^{13} T_2^{10} + 5145 T_1^{14} T_2^{10} + 624 T_1^{15} T_2^{10} - 153 T_1^{16} T_2^{10} - 600 T_1^{17} T_2^{10} - 165 T_1^{18} T_2^{10} - 6 T_1^{19} T_2^{10} - \right. \right. \\ \left. \left. 48 T_1^2 T_2^{11} - 555 T_1^3 T_2^{11} + 903 T_1^4 T_2^{11} + 360 T_1^5 T_2^{11} - 6642 T_1^6 T_2^{11} + 21174 T_1^7 T_2^{11} - 18987 T_1^8 T_2^{11} + \right. \right. \\ \left. \left. 5408 T_1^9 T_2^{11} + 21123 T_1^{10} T_2^{11} - 15157 T_1^{11} T_2^{11} + 819 T_1^{12} T_2^{11} + 8913 T_1^{13} T_2^{11} - 5970 T_1^{14} T_2^{11} - 33 T_1^{15} T_2^{11} - \right. \right. \\ \left. \left. 840 T_1^{16} T_2^{11} + 522 T_1^{17} T_2^{11} + 327 T_1^{18} T_2^{11} + 33 T_1^{19} T_2^{11} + 126 T_1^3 T_2^{12} + 462 T_1^4 T_2^{12} - 1911 T_1^5 T_2^{12} + \right. \right. \\ \left. \left. 3459 T_1^6 T_2^{12} - 4797 T_1^7 T_2^{12} - 3657 T_1^8 T_2^{12} + 9677 T_1^9 T_2^{12} - 10521 T_1^{10} T_2^{12} - 9603 T_1^{11} T_2^{12} + 19073 T_1^{12} T_2^{12} - \right. \right. \\ \left. \left. 16617 T_1^{13} T_2^{12} + 7233 T_1^{14} T_2^{12} - 861 T_1^{15} T_2^{12} + 939 T_1^{16} T_2^{12} + 66 T_1^{17} T_2^{12} - 414 T_1^{18} T_2^{12} - 84 T_1^{19} T_2^{12} - \right. \right. \\ \left. \left. 198 T_1^4 T_2^{13} - 18 T_1^5 T_2^{13} + 1311 T_1^6 T_2^{13} - 2238 T_1^7 T_2^{13} + 4503 T_1^8 T_2^{13} - 2235 T_1^9 T_2^{13} - 4104 T_1^{10} T_2^{13} + \right. \right. \\ \left. \left. 14784 T_1^{11} T_2^{13} - 12411 T_1^{12} T_2^{13} + 6183 T_1^{13} T_2^{13} - 417 T_1^{14} T_2^{13} - 1182 T_1^{15} T_2^{13} + 96 T_1^{16} T_2^{13} - 516 T_1^{17} T_2^{13} + \right. \right. \\ \left. \left. 258 T_1^{18} T_2^{13} + 144 T_1^{19} T_2^{13} + 210 T_1^5 T_2^{14} - 324 T_1^6 T_2^{14} - 795 T_1^7 T_2^{14} + 1746 T_1^8 T_2^{14} - 3378 T_1^9 T_2^{14} + \right. \right. \\ \left. \left. 5745 T_1^{10} T_2^{14} - 7365 T_1^{11} T_2^{14} + 3612 T_1^{12} T_2^{14} - 1653 T_1^{13} T_2^{14} + 228 T_1^{14} T_2^{14} - 219 T_1^{15} T_2^{14} + 261 T_1^{16} T_2^{14} + \right. \right. \\ \left. \left. 243 T_1^{17} T_2^{14} + 33 T_1^{18} T_2^{14} - 171 T_1^{19} T_2^{14} - 168 T_1^6 T_2^{15} + 507 T_1^7 T_2^{15} + 30 T_1^8 T_2^{15} - 792 T_1^9 T_2^{15} + 648 T_1^{10} T_2^{15} - \right. \right. \\ \left. \left. 417 T_1^{11} T_2^{15} + 882 T_1^{12} T_2^{15} - 54 T_1^{13} T_2^{15} + 198 T_1^{14} T_2^{15} - 102 T_1^{15} T_2^{15} + 195 T_1^{16} T_2^{15} - 147 T_1^{17} T_2^{15} - \right. \right. \\ \left. \left. 171 T_1^{18} T_2^{15} + 147 T_1^{19} T_2^{15} + 96 T_1^7 T_2^{16} - 426 T_1^8 T_2^{16} + 384 T_1^9 T_2^{16} + 348 T_1^{10} T_2^{16} - 921 T_1^{11} T_2^{16} + 993 T_1^{12} T_2^{16} - \right. \right. \\ \left. \left. 870 T_1^{13} T_2^{16} + 123 T_1^{14} T_2^{16} + 93 T_1^{15} T_2^{16} - 87 T_1^{16} T_2^{16} - 111 T_1^{17} T_2^{16} + 225 T_1^{18} T_2^{16} - 102 T_1^{19} T_2^{16} - 36 T_1^8 T_2^{17} + \right. \right. \\ \left. \left. 225 T_1^9 T_2^{17} - 441 T_1^{10} T_2^{17} + 354 T_1^{11} T_2^{17} - 12 T_1^{12} T_2^{17} - 339 T_1^{13} T_2^{17} + 537 T_1^{14} T_2^{17} - 318 T_1^{15} T_2^{17} + \right. \right. \\ \left. \left. 36 T_1^{16} T_2^{17} + 153 T_1^{17} T_2^{17} - 153 T_1^{18} T_2^{17} + 51 T_1^{19} T_2^{17} + 6 T_1^9 T_2^{18} - 54 T_1^{10} T_2^{18} + 159 T_1^{11} T_2^{18} - 249 T_1^{12} T_2^{18} + \right. \right. \\ \left. \left. 249 T_1^{13} T_2^{18} - 144 T_1^{14} T_2^{18} - 18 T_1^{15} T_2^{18} + 117 T_1^{16} T_2^{18} - 126 T_1^{17} T_2^{18} + 72 T_1^{18} T_2^{18} - 18 T_1^{19} T_2^{18} + 3 T_1^{11} T_2^{19} - \right. \right. \\ \left. \left. 15 T_1^{12} T_2^{19} + 36 T_1^{13} T_2^{19} - 57 T_1^{14} T_2^{19} + 66 T_1^{15} T_2^{19} - 57 T_1^{16} T_2^{19} + 36 T_1^{17} T_2^{19} - 15 T_1^{18} T_2^{19} + 3 T_1^{19} T_2^{19} \right) \left. \right\}$$

In[*]:= **KT** = λ[Knot[11, NonAlternating, 42]]

Out[*]=

$$\left\{ 1, \right.$$

$$-\frac{1}{T_1^9 T_2^9} \left(-3 + 18 T_1 - 48 T_1^2 + 87 T_1^3 - 102 T_1^4 + 81 T_1^5 - 36 T_1^6 + 6 T_1^7 + 18 T_2 - 96 T_1 T_2 + 231 T_1^2 T_2 - 381 T_1^3 T_2 + \right.$$

$$366 T_1^4 T_2 - 195 T_1^5 T_2 - 33 T_1^6 T_2 + 78 T_1^7 T_2 - 3 T_1^8 T_2 - 6 T_1^9 T_2 - 54 T_2^2 + 252 T_1 T_2^2 - 495 T_1^2 T_2^2 +$$

$$567 T_1^3 T_2^2 + 15 T_1^4 T_2^2 - 885 T_1^5 T_2^2 + 1425 T_1^6 T_2^2 - 897 T_1^7 T_2^2 + 132 T_1^8 T_2^2 - 84 T_1^9 T_2^2 + 39 T_1^{10} T_2^2 + 102 T_2^3 -$$

$$375 T_1 T_2^3 + 381 T_1^2 T_2^3 + 348 T_1^3 T_2^3 - 2172 T_1^4 T_2^3 + 3453 T_1^5 T_2^3 - 2607 T_1^6 T_2^3 - 342 T_1^7 T_2^3 + 1974 T_1^8 T_2^3 -$$

$$444 T_1^9 T_2^3 + 213 T_1^{10} T_2^3 - 111 T_1^{11} T_2^3 - 126 T_2^4 + 279 T_1 T_2^4 + 384 T_1^2 T_2^4 - 1896 T_1^3 T_2^4 + 3219 T_1^4 T_2^4 -$$

$$1500 T_1^5 T_2^4 - 4059 T_1^6 T_2^4 + 8565 T_1^7 T_2^4 - 7044 T_1^8 T_2^4 - 294 T_1^9 T_2^4 - 315 T_1^{10} T_2^4 + 18 T_1^{11} T_2^4 + 174 T_1^{12} T_2^4 +$$

$$108 T_2^5 - 18 T_1 T_2^5 - 1137 T_1^2 T_2^5 + 2055 T_1^3 T_2^5 + 18 T_1^4 T_2^5 - 6708 T_1^5 T_2^5 + 15 567 T_1^6 T_2^5 - 14 997 T_1^7 T_2^5 +$$

$$6471 T_1^8 T_2^5 + 6219 T_1^9 T_2^5 + 1248 T_1^{10} T_2^5 + 642 T_1^{11} T_2^5 - 585 T_1^{12} T_2^5 - 165 T_1^{13} T_2^5 - 54 T_2^6 - 258 T_1 T_2^6 +$$

$$1335 T_1^2 T_2^6 - 345 T_1^3 T_2^6 - 5988 T_1^4 T_2^6 + 15 207 T_1^5 T_2^6 - 22 213 T_1^6 T_2^6 + 12 054 T_1^7 T_2^6 - 1311 T_1^8 T_2^6 -$$

$$9616 T_1^9 T_2^6 - 8133 T_1^{10} T_2^6 - 2379 T_1^{11} T_2^6 + 315 T_1^{12} T_2^6 + 1017 T_1^{13} T_2^6 + 81 T_1^{14} T_2^6 + 12 T_2^7 + 249 T_1 T_2^7 -$$

$$429 T_1^2 T_2^7 - 2703 T_1^3 T_2^7 + 10 386 T_1^4 T_2^7 - 15 783 T_1^5 T_2^7 + 16 422 T_1^6 T_2^7 - 232 T_1^7 T_2^7 - 456 T_1^8 T_2^7 +$$

$$2957 T_1^9 T_2^7 + 18 456 T_1^{10} T_2^7 + 6513 T_1^{11} T_2^7 + 3432 T_1^{12} T_2^7 - 2679 T_1^{13} T_2^7 - 699 T_1^{14} T_2^7 - 12 T_1^{15} T_2^7 -$$

$$90 T_1 T_2^8 - 255 T_1^2 T_2^8 + 2799 T_1^3 T_2^8 - 6048 T_1^4 T_2^8 + 3615 T_1^5 T_2^8 - 717 T_1^6 T_2^8 - 9549 T_1^7 T_2^8 - 9067 T_1^8 T_2^8 +$$

$$11 528 T_1^9 T_2^8 - 24 393 T_1^{10} T_2^8 - 8349 T_1^{11} T_2^8 - 12 579 T_1^{12} T_2^8 + 2106 T_1^{13} T_2^8 + 2868 T_1^{14} T_2^8 + 117 T_1^{15} T_2^8 +$$

$$6 T_1 T_2^9 + 216 T_1^2 T_2^9 - 1017 T_1^3 T_2^9 + 663 T_1^4 T_2^9 + 2703 T_1^5 T_2^9 + 107 T_1^6 T_2^9 - 2413 T_1^7 T_2^9 + 29 681 T_1^8 T_2^9 -$$

$$22 935 T_1^9 T_2^9 + 23 513 T_1^{10} T_2^9 + 3131 T_1^{11} T_2^9 + 17 276 T_1^{12} T_2^9 + 7584 T_1^{13} T_2^9 - 6894 T_1^{14} T_2^9 - 561 T_1^{15} T_2^9 -$$

$$12 T_2^{10} + 579 T_1 T_2^{10} - 879 T_1^2 T_2^{10} - 4593 T_1^3 T_2^{10} + 8424 T_1^4 T_2^{10} - 26 310 T_1^5 T_2^{10} + 12 545 T_1^6 T_2^{10} -$$

$$14 005 T_1^7 T_2^{10} - 3189 T_1^8 T_2^{10} + 117 T_1^9 T_2^{10} - 26 763 T_1^{10} T_2^{10} + 9870 T_1^{11} T_2^{10} + 1656 T_1^{12} T_2^{10} - 6 T_1^{13} T_2^{10} -$$

$$54 T_1^{14} T_2^{10} + 192 T_1^{15} T_2^{10} - 651 T_1^{16} T_2^{10} + 2322 T_1^{17} T_2^{10} - 2628 T_1^{18} T_2^{10} + 13 011 T_1^{19} T_2^{10} - 5122 T_1^{20} T_2^{10} +$$

$$5505 T_1^{21} T_2^{10} + 18 968 T_1^{22} T_2^{10} - 33 633 T_1^{23} T_2^{10} + 39 975 T_1^{24} T_2^{10} - 7218 T_1^{25} T_2^{10} - 3216 T_1^{26} T_2^{10} +$$

$$33 T_1^3 T_2^{12} + 45 T_1^4 T_2^{12} - 537 T_1^5 T_2^{12} + 771 T_1^6 T_2^{12} + 1347 T_1^7 T_2^{12} - 9336 T_1^8 T_2^{12} + 2219 T_1^9 T_2^{12} +$$

$$12 168 T_1^{10} T_2^{12} - 43 833 T_1^{11} T_2^{12} + 52 331 T_1^{12} T_2^{12} - 31 965 T_1^{13} T_2^{12} - 726 T_1^{14} T_2^{12} + 4227 T_1^{15} T_2^{12} -$$

$$72 T_1^4 T_2^{13} + 147 T_1^5 T_2^{13} + 675 T_1^6 T_2^{13} - 3276 T_1^7 T_2^{13} + 4440 T_1^8 T_2^{13} + 7593 T_1^9 T_2^{13} - 26 265 T_1^{10} T_2^{13} +$$

$$43 053 T_1^{11} T_2^{13} - 33 975 T_1^{12} T_2^{13} + 8577 T_1^{13} T_2^{13} + 7326 T_1^{14} T_2^{13} - 3753 T_1^{15} T_2^{13} + 87 T_1^5 T_2^{14} - 447 T_1^6 T_2^{14} +$$

$$555 T_1^7 T_2^{14} + 2031 T_1^8 T_2^{14} - 9648 T_1^9 T_2^{14} + 16 401 T_1^{10} T_2^{14} - 16 125 T_1^{11} T_2^{14} + 4986 T_1^{12} T_2^{14} + 6123 T_1^{13} T_2^{14} -$$

$$6993 T_1^{14} T_2^{14} + 2121 T_1^{15} T_2^{14} - 51 T_1^6 T_2^{15} + 399 T_1^7 T_2^{15} - 1389 T_1^8 T_2^{15} + 2568 T_1^9 T_2^{15} - 2016 T_1^{10} T_2^{15} -$$

$$849 T_1^{11} T_2^{15} + 4476 T_1^{12} T_2^{15} - 5373 T_1^{13} T_2^{15} + 3006 T_1^{14} T_2^{15} - 696 T_1^{15} T_2^{15} + 9 T_1^7 T_2^{16} - 84 T_1^8 T_2^{16} +$$

$$366 T_1^9 T_2^{16} - 945 T_1^{10} T_2^{16} + 1551 T_1^{11} T_2^{16} - 1731 T_1^{12} T_2^{16} + 1263 T_1^{13} T_2^{16} - 531 T_1^{14} T_2^{16} + 105 T_1^{15} T_2^{16} \left. \right\}$$

In[*]:= Simplify[KT == Conway]

Out[*]=

$$\left\{ \emptyset, \frac{1}{T_1^9 T_2^9} 3 \left(4 - 25 T_2 + 70 T_2^2 - 122 T_2^3 + 147 T_2^4 - 124 T_2^5 + 74 T_2^6 - 26 T_2^7 + \right. \right.$$

$$4 T_2^8 + T_1^{19} T_2^{10} \left(-2 + 11 T_2 - 28 T_2^2 + 48 T_2^3 - 57 T_2^4 + 49 T_2^5 - 34 T_2^6 + 17 T_2^7 - 6 T_2^8 + T_2^9 \right) +$$

$$T_1^{18} T_2^9 \left(12 - 55 T_2 + 109 T_2^2 - 138 T_2^3 + 86 T_2^4 + 11 T_2^5 - 57 T_2^6 + 75 T_2^7 - 51 T_2^8 + 24 T_2^9 - 5 T_2^{10} \right) +$$

$$T_1 \left(-23 + 129 T_2 - 312 T_2^2 + 436 T_2^3 - 346 T_2^4 + 59 T_2^5 + 201 T_2^6 - 291 T_2^7 + 171 T_2^8 - 46 T_2^9 + 4 T_2^{10} \right) + T_1^{17} T_2^8$$

$$\left(-36 + 136 T_2 - 200 T_2^2 + 174 T_2^3 + 22 T_2^4 - 172 T_2^5 + 81 T_2^6 - 49 T_2^7 - 37 T_2^8 + 51 T_2^9 - 42 T_2^{10} + 12 T_2^{11} \right) -$$

$$T_1^2 \left(-67 + 334 T_2 - 660 T_2^2 + 595 T_2^3 + 128 T_2^4 - 1097 T_2^5 + 1513 T_2^6 - 1128 T_2^7 + \right.$$

$$209 T_2^8 + 179 T_2^9 - 104 T_2^{10} + 14 T_2^{11} \left. \right) + T_1^{16} T_2^7 \left(72 - 215 T_2 + 190 T_2^2 - 51 T_2^3 - \right.$$

$$280 T_2^4 + 313 T_2^5 + 32 T_2^6 + 87 T_2^7 + 65 T_2^8 - 29 T_2^9 + 12 T_2^{10} + 39 T_2^{11} - 19 T_2^{12} \left. \right) +$$

$$T_1^3 \left(-132 + 560 T_2 - 770 T_2^2 - 120 T_2^3 + 2222 T_2^4 - 4115 T_2^5 + 4081 T_2^6 - 2064 T_2^7 - 378 T_2^8 + \right.$$

$$471 T_2^9 + 113 T_2^{10} - 167 T_2^{11} + 31 T_2^{12} \left. \right) + T_1^4 \left(181 - 600 T_2 + 244 T_2^2 + 1898 T_2^3 - 5265 T_2^4 + \right.$$

$$7033 T_2^5 - 4971 T_2^6 + 354 T_2^7 + 2536 T_2^8 - 230 T_2^9 - 887 T_2^{10} + 237 T_2^{11} + 139 T_2^{12} - 42 T_2^{13} \left. \right) +$$

$$T_1^{15} T_2^6 \left(-110 + 257 T_2 - 135 T_2^2 + 214 T_2^3 - 344 T_2^4 + 1061 T_2^5 - 1696 T_2^6 + 857 T_2^7 - \right.$$

$$780 T_2^8 + 198 T_2^9 - 4 T_2^{10} - 106 T_2^{11} - 6 T_2^{12} + 22 T_2^{13} \left. \right) +$$

$$T_1^{14} T_2^5 \left(132 - 216 T_2 + 36 T_2^2 - 599 T_2^3 + 1107 T_2^4 - 1575 T_2^5 + 416 T_2^6 + 2653 T_2^7 - \right.$$

$$2581 T_2^8 + 2407 T_2^9 - 936 T_2^{10} + 218 T_2^{11} + 179 T_2^{12} - 48 T_2^{13} - 19 T_2^{14} \left. \right) +$$

$$T_1^5 \left(-181 + 373 T_2 + 750 T_2^2 - 3747 T_2^3 + 7176 T_2^4 - 7365 T_2^5 + 3016 T_2^6 + 2283 T_2^7 - \right.$$

$$2062 T_2^8 - 3415 T_2^9 + 2204 T_2^{10} + 337 T_2^{11} - 458 T_2^{12} - 55 T_2^{13} + 41 T_2^{14} \left. \right) +$$

$$T_1^6 \left(132 - 37 T_2 - 1332 T_2^2 + 3480 T_2^3 - 4716 T_2^4 + 2261 T_2^5 + 2403 T_2^6 - 4198 T_2^7 - 1651 T_2^8 + \right.$$

$$6728 T_2^9 + 338 T_2^{10} - 2988 T_2^{11} + 896 T_2^{12} + 212 T_2^{13} + 41 T_2^{14} - 39 T_2^{15} \left. \right) +$$

$$T_1^{13} T_2^4 \left(-124 + 86 T_2 + 165 T_2^2 + 356 T_2^3 + 699 T_2^4 - 3319 T_2^5 + 7797 T_2^6 - 10354 T_2^7 + \right.$$

$$5116 T_2^8 - 798 T_2^9 - 2592 T_2^{10} + 1773 T_2^{11} - 711 T_2^{12} - 113 T_2^{13} + 83 T_2^{14} + 12 T_2^{15} \left. \right) -$$

$$T_1^{12} T_2^3 \left(-90 - 72 T_2 + 405 T_2^2 - 301 T_2^3 + 2344 T_2^4 - 3787 T_2^5 + 3246 T_2^6 + 2435 T_2^7 - 11484 T_2^8 + \right.$$

$$11086 T_2^9 - 7188 T_2^{10} + 458 T_2^{11} + 1198 T_2^{12} - 908 T_2^{13} + 4 T_2^{14} + 83 T_2^{15} + 5 T_2^{16} \left. \right) +$$

$$T_1^7 \left(-69 - 166 T_2 + 1066 T_2^2 - 1563 T_2^3 + 1218 T_2^4 + 904 T_2^5 - 1470 T_2^6 - 1818 T_2^7 + 7715 T_2^8 - \right.$$

$$3364 T_2^9 - 10102 T_2^{10} + 7934 T_2^{11} - 2048 T_2^{12} + 346 T_2^{13} - 450 T_2^{14} + 36 T_2^{15} + 29 T_2^{16} \left. \right) +$$

$$T_1^{10} T_2 \left(20 + 142 T_2 - 117 T_2^2 - 340 T_2^3 - 457 T_2^4 + 1548 T_2^5 - 7692 T_2^6 + 15286 T_2^7 - 18243 T_2^8 + \right.$$

$$9878 T_2^9 + 5206 T_2^{10} - 7563 T_2^{11} + 7387 T_2^{12} - 3552 T_2^{13} + 888 T_2^{14} + 431 T_2^{15} - 147 T_2^{16} - 18 T_2^{17} \left. \right) +$$

$$T_1^8 \left(24 + 170 T_2 - 364 T_2^2 - 211 T_2^3 + 668 T_2^4 - 1403 T_2^5 - 561 T_2^6 + 2585 T_2^7 + 77 T_2^8 - 13928 T_2^9 + \right.$$

$$23438 T_2^{10} - 10666 T_2^{11} + 1893 T_2^{12} + 21 T_2^{13} - 95 T_2^{14} + 473 T_2^{15} - 114 T_2^{16} - 12 T_2^{17} \left. \right) +$$

$$T_1^{11} T_2^2 \left(-50 - 152 T_2 + 330 T_2^2 + 91 T_2^3 + 454 T_2^4 + 1366 T_2^5 - 2630 T_2^6 + 2130 T_2^7 + 2608 T_2^8 - \right.$$

$$11375 T_2^9 + 11410 T_2^{10} - 9423 T_2^{11} + 2920 T_2^{12} + 144 T_2^{13} - 824 T_2^{14} + 118 T_2^{15} + 53 T_2^{16} + T_2^{17} \left. \right) +$$

$$T_1^9 \left(-4 - 90 T_2 - 46 T_2^2 + 342 T_2^3 + 477 T_2^4 - 1396 T_2^5 + 3716 T_2^6 - 1018 T_2^7 - 8898 T_2^8 + 22024 T_2^9 - 21165 \right.$$

$$\left. T_2^{10} + 3510 T_2^{11} + 2486 T_2^{12} - 3276 T_2^{13} + 2090 T_2^{14} - 1120 T_2^{15} + 6 T_2^{16} + 75 T_2^{17} + 2 T_2^{18} \right) \left. \right\} == \{ \emptyset, \emptyset \}$$

In[*]:= **Simplify**[KT == Conway /. T₁ → 1]

Out[*]=

$$\left\{ \theta, 3 \left(-12958 - \frac{1}{T_2^9} + \frac{58}{T_2^7} - \frac{381}{T_2^6} + \frac{1391}{T_2^5} - \frac{3602}{T_2^4} + \frac{7118}{T_2^3} - \frac{11014}{T_2^2} + \frac{13462}{T_2} + 9668 T_2 - 5365 T_2^2 + 1942 T_2^3 - 170 T_2^4 - 306 T_2^5 + 227 T_2^6 - 86 T_2^7 + 19 T_2^8 - 2 T_2^9 \right) \right\} == \{ \theta, \theta \}$$

In[*]:= **Simplify**[KT == Conway /. T₂ → 1]

Out[*]=

$$\left\{ \theta, 3 \left(-2285 + \frac{2}{T_1^9} - \frac{18}{T_1^8} + \frac{84}{T_1^7} - \frac{268}{T_1^6} + \frac{627}{T_1^5} - \frac{1103}{T_1^4} + \frac{1530}{T_1^3} - \frac{1802}{T_1^2} + \frac{1995}{T_1} + 2657 T_1 - 2829 T_1^2 + 2566 T_1^3 - 1924 T_1^4 + 1174 T_1^5 - 572 T_1^6 + 216 T_1^7 - 60 T_1^8 + 11 T_1^9 - T_1^{10} \right) \right\} == \{ \theta, \theta \}$$

In[*]:= **K31** = λ[Knot[3, 1]]
K31 = λ[Mirror@Knot[3, 1]]

Out[*]=

$$\left\{ \frac{1 - T + T^2}{T}, \right.$$

$$- \frac{1}{T_1^5 T_2^5} \left(-6 + 15 T_1 - 21 T_1^2 + 15 T_1^3 - 6 T_1^4 + 27 T_2 - 54 T_1 T_2 + 55 T_1^2 T_2 - 8 T_1^3 T_2 - 18 T_1^4 T_2 + 19 T_1^5 T_2 - 57 T_2^2 + \right.$$

$$58 T_1 T_2^2 + 6 T_1^2 T_2^2 - 114 T_1^3 T_2^2 + 68 T_1^4 T_2^2 - 6 T_1^5 T_2^2 - 43 T_1^6 T_2^2 + 78 T_2^3 - 2 T_1 T_2^3 - 84 T_1^2 T_2^3 + 139 T_1^3 T_2^3 +$$

$$84 T_1^4 T_2^3 - 108 T_1^5 T_2^3 + 85 T_1^6 T_2^3 + 55 T_1^7 T_2^3 - 63 T_2^4 - 120 T_1 T_2^4 + 140 T_1^2 T_2^4 - 75 T_1^3 T_2^4 - 284 T_1^4 T_2^4 +$$

$$117 T_1^5 T_2^4 - 54 T_1^6 T_2^4 - 116 T_1^7 T_2^4 - 59 T_1^8 T_2^4 + 33 T_2^5 + 148 T_1 T_2^5 + 36 T_1^2 T_2^5 - 177 T_1^3 T_2^5 + 417 T_1^4 T_2^5 +$$

$$90 T_1^5 T_2^5 - 94 T_1^6 T_2^5 + 197 T_1^7 T_2^5 + 114 T_1^8 T_2^5 + 44 T_1^9 T_2^5 - 6 T_2^6 - 108 T_1 T_2^6 - 136 T_1^2 T_2^6 + 118 T_1^3 T_2^6 -$$

$$132 T_1^4 T_2^6 - 361 T_1^5 T_2^6 + 22 T_1^6 T_2^6 - 21 T_1^7 T_2^6 - 246 T_1^8 T_2^6 - 69 T_1^9 T_2^6 - 24 T_1^{10} T_2^6 + 24 T_1 T_2^7 + 162 T_1^2 T_2^7 -$$

$$20 T_1^3 T_2^7 - 50 T_1^4 T_2^7 + 326 T_1^5 T_2^7 + 102 T_1^6 T_2^7 - 8 T_1^7 T_2^7 + 140 T_1^8 T_2^7 + 148 T_1^9 T_2^7 + 33 T_1^{10} T_2^7 + 9 T_1^{11} T_2^7 -$$

$$45 T_1^2 T_2^8 - 117 T_1^3 T_2^8 + 115 T_1^4 T_2^8 - 99 T_1^5 T_2^8 - 258 T_1^6 T_2^8 + 107 T_1^7 T_2^8 - 114 T_1^8 T_2^8 - 97 T_1^9 T_2^8 - 48 T_1^{10} T_2^8 -$$

$$18 T_1^{11} T_2^8 + 48 T_1^3 T_2^9 + 18 T_1^4 T_2^9 - 61 T_1^5 T_2^9 + 132 T_1^6 T_2^9 + 52 T_1^7 T_2^9 - 64 T_1^8 T_2^9 + 114 T_1^9 T_2^9 + 3 T_1^{10} T_2^9 +$$

$$27 T_1^{11} T_2^9 - 30 T_1^4 T_2^{10} + 36 T_1^5 T_2^{10} - 33 T_1^6 T_2^{10} - 27 T_1^7 T_2^{10} + 21 T_1^8 T_2^{10} - 36 T_1^9 T_2^{10} + 6 T_1^{10} T_2^{10} -$$

$$18 T_1^{11} T_2^{10} + 9 T_1^5 T_2^{11} - 24 T_1^6 T_2^{11} + 45 T_1^7 T_2^{11} - 48 T_1^8 T_2^{11} + 42 T_1^9 T_2^{11} - 21 T_1^{10} T_2^{11} + 9 T_1^{11} T_2^{11} \left. \right\}$$

Out[*]=

$$\left\{ \frac{1 - T + T^2}{T}, \right.$$

$$- \frac{1}{T_1^4 T_2^4} \left(3 - 5 T_1 + 5 T_1^2 - 3 T_1^3 + T_1^4 - 5 T_2 + 7 T_1^2 T_2 - 18 T_1^3 T_2 + 18 T_1^4 T_2 - 16 T_1^5 T_2 + 6 T_1^6 T_2 - 3 T_1^7 T_2 + 5 T_2^2 + \right.$$

$$7 T_1 T_2^2 - 7 T_1^2 T_2^2 + 24 T_1^3 T_2^2 - 17 T_1^4 T_2^2 + 32 T_1^5 T_2^2 - 7 T_1^6 T_2^2 + 9 T_1^7 T_2^2 + 6 T_1^8 T_2^2 - 3 T_2^3 - 12 T_1 T_2^3 -$$

$$37 T_1^2 T_2^3 + 7 T_1^3 T_2^3 - 18 T_1^4 T_2^3 - 67 T_1^5 T_2^3 + 37 T_1^6 T_2^3 - 42 T_1^7 T_2^3 - 3 T_1^8 T_2^3 + T_2^4 + 9 T_1 T_2^4 + 13 T_1^2 T_2^4 +$$

$$40 T_1^3 T_2^4 + 33 T_1^4 T_2^4 + 3 T_1^5 T_2^4 + 87 T_1^6 T_2^4 + 45 T_1^7 T_2^4 - 22 T_1^8 T_2^4 + 60 T_1^9 T_2^4 - 3 T_1^{10} T_2^4 - 4 T_1 T_2^5 -$$

$$13 T_1^2 T_2^5 - 42 T_1^3 T_2^5 - 78 T_1^4 T_2^5 + 11 T_1^5 T_2^5 - 117 T_1^6 T_2^5 - 74 T_1^7 T_2^5 - 27 T_1^8 T_2^5 - 24 T_1^9 T_2^5 - 45 T_1^{10} T_2^5 +$$

$$6 T_1^{11} T_2^5 + 8 T_1^2 T_2^6 + 26 T_1^3 T_2^6 + 96 T_1^4 T_2^6 + 33 T_1^5 T_2^6 + 47 T_1^6 T_2^6 + 165 T_1^7 T_2^6 + 32 T_1^8 T_2^6 + 30 T_1^9 T_2^6 +$$

$$57 T_1^{10} T_2^6 + 12 T_1^{11} T_2^6 - 3 T_1^{12} T_2^6 - 14 T_1^3 T_2^7 - 63 T_1^4 T_2^7 - 71 T_1^5 T_2^7 - 36 T_1^6 T_2^7 - 87 T_1^7 T_2^7 - 151 T_1^8 T_2^7 +$$

$$27 T_1^9 T_2^7 - 75 T_1^{10} T_2^7 - 27 T_1^{11} T_2^7 + 29 T_1^4 T_2^8 + 57 T_1^5 T_2^8 + 41 T_1^6 T_2^8 + 29 T_1^7 T_2^8 + 126 T_1^8 T_2^8 + 21 T_1^9 T_2^8 +$$

$$27 T_1^{10} T_2^8 + 42 T_1^{11} T_2^8 + 6 T_1^{12} T_2^8 - 33 T_1^5 T_2^9 - 30 T_1^6 T_2^9 - 69 T_1^7 T_2^9 - 30 T_1^8 T_2^9 - 15 T_1^{10} T_2^9 - 21 T_1^{11} T_2^9 -$$

$$15 T_1^{12} T_2^9 + 27 T_1^6 T_2^{10} - 9 T_1^7 T_2^{10} + 18 T_1^8 T_2^{10} + 24 T_1^9 T_2^{10} + 9 T_1^{10} T_2^{10} + 15 T_1^{12} T_2^{10} - 12 T_1^7 T_2^{11} + 12 T_1^8 T_2^{11} -$$

$$12 T_1^9 T_2^{11} - 9 T_1^{10} T_2^{11} + 9 T_1^{11} T_2^{11} - 9 T_1^{12} T_2^{11} + 3 T_1^8 T_2^{12} - 6 T_1^9 T_2^{12} + 9 T_1^{10} T_2^{12} - 6 T_1^{11} T_2^{12} + 3 T_1^{12} T_2^{12} \left. \right\}$$

In[*]:= **K41** = λ[Knot[4, 1]]

Out[*]=

$$\left\{ - \frac{1 - 3 T + T^2}{T}, \right.$$

$$- \frac{1}{T_1^4 T_2^4} \left((1 - 3 T_1 + T_1^2) (-1 + T_1 T_2) (1 - 3 T_2 + T_2^2) (1 - 3 T_1 T_2 + T_1^2 T_2^2) (-9 T_1 + 11 T_1^2 - 3 T_2 + 27 T_1 T_2 - \right.$$

$$15 T_1^2 T_2 - 19 T_1^3 T_2 + 2 T_2^2 - 42 T_1 T_2^2 + 51 T_1^2 T_2^2 + 24 T_1^3 T_2^2 + 24 T_1^4 T_2^2 - 27 T_1^5 T_2^2 + 6 T_1^6 T_2^2 + 32 T_1 T_2^3 -$$

$$27 T_1^2 T_2^3 - 54 T_1^3 T_2^3 - 78 T_1^4 T_2^3 + 30 T_1^5 T_2^3 + 9 T_1^6 T_2^3 - 3 T_1^7 T_2^3 - 15 T_1 T_2^4 - 15 T_1^2 T_2^4 + 96 T_1^3 T_2^4 - 9 T_1^4 T_2^4 +$$

$$144 T_1^5 T_2^4 - 60 T_1^6 T_2^4 + 3 T_1^7 T_2^4 + 3 T_1 T_2^5 + 21 T_1^2 T_2^5 - 75 T_1^3 T_2^5 + 63 T_1^4 T_2^5 - 135 T_1^5 T_2^5 + 9 T_1^6 T_2^5 +$$

$$12 T_1^7 T_2^5 - 6 T_1^2 T_2^6 + 18 T_1^3 T_2^6 - 18 T_1^4 T_2^6 + 21 T_1^5 T_2^6 + 27 T_1^6 T_2^6 - 12 T_1^7 T_2^6 + 3 T_1^5 T_2^7 - 9 T_1^6 T_2^7 + 3 T_1^7 T_2^7 \left. \right\}$$