

```
In[*]:= L0 = Plus [
  CF[R1,2[[2]]], CF[R1,2[[3, 1]]], CF[R3,4[[2]]], CF[R3,4[[3, 1]]]
]
```

Out[*]=

$$\begin{aligned}
 & (-1 + T_1) p_{1,1} x_{1,2} + (1 - T_1) p_{1,2} x_{1,2} + \frac{(1 - T_1) p_{1,3} x_{1,4}}{T_1} + \frac{(-1 + T_1) p_{1,4} x_{1,4}}{T_1} + \\
 & \frac{(-T_2 + T_1 T_2) p_{3,2} x_{1,1} x_{2,1} + (-1 + T_2) p_{2,1} x_{2,2} + (1 - T_2) p_{2,2} x_{2,2} + (1 - T_1) p_{3,2} x_{1,1} x_{2,2} +}{T_1 T_2} + \\
 & \frac{(1 - T_1) p_{3,4} x_{1,3} x_{2,3}}{T_2} + \frac{(1 - T_2) p_{2,3} x_{2,4}}{T_2} + \frac{(-1 + T_2) p_{2,4} x_{2,4}}{T_2} + \frac{(-1 + T_1) p_{3,4} x_{1,3} x_{2,4}}{T_1} + \\
 & (-1 + T_1 T_2) p_{3,1} x_{3,2} + (1 - T_1 T_2) p_{3,2} x_{3,2} + \frac{(1 - T_1 T_2) p_{3,3} x_{3,4}}{T_1 T_2} + \frac{(-1 + T_1 T_2) p_{3,4} x_{3,4}}{T_1 T_2}
 \end{aligned}$$

```
In[*]:= Sum[D[L0, xv,1, pv,3] + D[L0, xv,1] D[L0, pv,3], {v, 3}]
```

Out[*]=

$$\frac{(1 - T_1) x_{1,4} ((-T_2 + T_1 T_2) p_{3,2} x_{2,1} + (1 - T_1) p_{3,2} x_{2,2})}{T_1} + \frac{(1 - T_2) (-T_2 + T_1 T_2) p_{3,2} x_{1,1} x_{2,4}}{T_2}$$

```
In[*]:= CF@Sum[D[L0, xv,1, pv,3] + D[L0, xv,1] D[L0, pv,3], {v, 3}]
L1 = CF[L0 - Sum[D[L0, xv,1, pv,3] + D[L0, xv,1] D[L0, pv,3], {v, 3}]]
L1 = CF[L1 /. {pv,3 -> pv,1, xv,3 -> xv,1}]
```

$$\text{Out[*]} = \frac{(-T_2 + 2 T_1 T_2 - T_1^2 T_2) p_{3,2} x_{1,4} x_{2,1}}{T_1} + \frac{(1 - 2 T_1 + T_1^2) p_{3,2} x_{1,4} x_{2,2}}{T_1} + (-1 + T_1 + T_2 - T_1 T_2) p_{3,2} x_{1,1} x_{2,4}$$

$$\begin{aligned} \text{Out[*]} = & (-1 + T_1) p_{1,1} x_{1,2} + (1 - T_1) p_{1,2} x_{1,2} + \frac{(1 - T_1) p_{1,3} x_{1,4}}{T_1} + \frac{(-1 + T_1) p_{1,4} x_{1,4}}{T_1} + \\ & (-T_2 + T_1 T_2) p_{3,2} x_{1,1} x_{2,1} + \frac{(T_2 - 2 T_1 T_2 + T_1^2 T_2) p_{3,2} x_{1,4} x_{2,1}}{T_1} + (-1 + T_2) p_{2,1} x_{2,2} + \\ & (1 - T_2) p_{2,2} x_{2,2} + (1 - T_1) p_{3,2} x_{1,1} x_{2,2} + \frac{(-1 + 2 T_1 - T_1^2) p_{3,2} x_{1,4} x_{2,2}}{T_1} + \frac{(1 - T_1) p_{3,4} x_{1,3} x_{2,3}}{T_1 T_2} + \\ & \frac{(1 - T_2) p_{2,3} x_{2,4}}{T_2} + \frac{(-1 + T_2) p_{2,4} x_{2,4}}{T_2} + (1 - T_1 - T_2 + T_1 T_2) p_{3,2} x_{1,1} x_{2,4} + \frac{(-1 + T_1) p_{3,4} x_{1,3} x_{2,4}}{T_1} + \\ & (-1 + T_1 T_2) p_{3,1} x_{3,2} + (1 - T_1 T_2) p_{3,2} x_{3,2} + \frac{(1 - T_1 T_2) p_{3,3} x_{3,4}}{T_1 T_2} + \frac{(-1 + T_1 T_2) p_{3,4} x_{3,4}}{T_1 T_2} \end{aligned}$$

$$\begin{aligned} \text{Out[*]} = & (-1 + T_1) p_{1,1} x_{1,2} + (1 - T_1) p_{1,2} x_{1,2} + \frac{(1 - T_1) p_{1,1} x_{1,4}}{T_1} + \frac{(-1 + T_1) p_{1,4} x_{1,4}}{T_1} + \\ & (-T_2 + T_1 T_2) p_{3,2} x_{1,1} x_{2,1} + \frac{(1 - T_1) p_{3,4} x_{1,1} x_{2,1}}{T_1 T_2} + \frac{(T_2 - 2 T_1 T_2 + T_1^2 T_2) p_{3,2} x_{1,4} x_{2,1}}{T_1} + \\ & (-1 + T_2) p_{2,1} x_{2,2} + (1 - T_2) p_{2,2} x_{2,2} + (1 - T_1) p_{3,2} x_{1,1} x_{2,2} + \frac{(-1 + 2 T_1 - T_1^2) p_{3,2} x_{1,4} x_{2,2}}{T_1} + \\ & \frac{(1 - T_2) p_{2,1} x_{2,4}}{T_2} + \frac{(-1 + T_2) p_{2,4} x_{2,4}}{T_2} + (1 - T_1 - T_2 + T_1 T_2) p_{3,2} x_{1,1} x_{2,4} + \frac{(-1 + T_1) p_{3,4} x_{1,1} x_{2,4}}{T_1} + \\ & (-1 + T_1 T_2) p_{3,1} x_{3,2} + (1 - T_1 T_2) p_{3,2} x_{3,2} + \frac{(1 - T_1 T_2) p_{3,1} x_{3,4}}{T_1 T_2} + \frac{(-1 + T_1 T_2) p_{3,4} x_{3,4}}{T_1 T_2} \end{aligned}$$

```
In[*]:= Factor@CF[R2LHS0[[2]] + R2LHS0[[3, 1]] - L1]
```

$$\text{Out[*]} = \frac{(-1 + T_1)^2 (-1 + T_2) p_{3,2} x_{1,4} x_{2,4}}{T_1}$$

In[*]:= **CF@Sum[D[L1, xv,2, pv,4] + D[L1, xv,2] D[L1, pv,4], {v, 3}]**

L2 = CF[L1 - Sum[D[L1, xv,2, pv,4] + D[L1, xv,2] D[L1, pv,4], {v, 3}]] /. {pv,4 -> pv,2, xv,4 -> xv,2}

Out[*]=

$$\begin{aligned} & \frac{(1 - 2 T_1 + T_1^2) p_{1,1} x_{1,4}}{T_1} + \frac{(-1 + 2 T_1 - T_1^2) p_{1,2} x_{1,4}}{T_1} + \frac{(-1 + T_1 + T_1 T_2 - T_1^2 T_2) p_{3,1} x_{1,1} x_{2,1}}{T_1 T_2} + \\ & \frac{(1 - T_1 - T_1 T_2 + T_1^2 T_2) p_{3,2} x_{1,1} x_{2,1}}{T_1 T_2} + \frac{(1 - 2 T_2 + T_2^2) p_{2,1} x_{2,4}}{T_2} + \frac{(-1 + 2 T_2 - T_2^2) p_{2,2} x_{2,4}}{T_2} + \\ & \frac{(1 - T_1 - T_1 T_2 + T_1^2 T_2) p_{3,1} x_{1,1} x_{2,4}}{T_1} + \frac{(-T_1 + T_1^2 - T_2 + 2 T_1 T_2 - T_1^2 T_2 + T_1 T_2^2 - T_1^2 T_2^2) p_{3,2} x_{1,1} x_{2,4}}{T_1 T_2} + \\ & \frac{(1 - 2 T_1 + T_1^2 - T_2 + 2 T_1 T_2 - T_1^2 T_2) p_{3,2} x_{1,4} x_{2,4}}{T_1 T_2} + \\ & \frac{(1 - 2 T_1 T_2 + T_1^2 T_2^2) p_{3,1} x_{3,4}}{T_1 T_2} + \frac{(-1 + 2 T_1 T_2 - T_1^2 T_2^2) p_{3,2} x_{3,4}}{T_1 T_2} \end{aligned}$$

Out[*]=

$$\begin{aligned} & \frac{(1 - T_1 - T_1 T_2 + T_1^2 T_2) p_{3,1} x_{1,1} x_{2,1}}{T_1 T_2} + (1 - T_1 - T_2 + T_1 T_2) p_{3,2} x_{1,1} x_{2,1} + \\ & \frac{(T_2 - 2 T_1 T_2 + T_1^2 T_2) p_{3,2} x_{1,2} x_{2,1}}{T_1} + \frac{(-1 + T_1 + T_1 T_2 - T_1^2 T_2) p_{3,1} x_{1,1} x_{2,2}}{T_1} + \\ & \frac{(1 - T_1 + T_2 - T_1 T_2 - 2 T_2^2 + 2 T_1 T_2^2) p_{3,2} x_{1,1} x_{2,2}}{T_2} + \frac{(-1 + 2 T_1 - T_1^2) p_{3,2} x_{1,2} x_{2,2}}{T_1 T_2} \end{aligned}$$

In[*]:= **CF[R2LHS[[3, 1]] - L2]**

Out[*]=

$$\begin{aligned} & \frac{(-1 + T_1 + T_1 T_2 - T_1^2 T_2) p_{3,1} x_{1,1} x_{2,1}}{T_1 T_2} + (-1 + T_1 + T_2 - T_1 T_2) p_{3,2} x_{1,1} x_{2,1} + \\ & \frac{(-T_2 + 2 T_1 T_2 - T_1^2 T_2) p_{3,2} x_{1,2} x_{2,1}}{T_1} + \frac{(1 - T_1 - T_1 T_2 + T_1^2 T_2) p_{3,1} x_{1,1} x_{2,2}}{T_1} + \\ & \frac{(-1 + T_1 - T_2 + T_1 T_2 + 2 T_2^2 - 2 T_1 T_2^2) p_{3,2} x_{1,1} x_{2,2}}{T_2} + \frac{(1 - 2 T_1 + T_1^2) p_{3,2} x_{1,2} x_{2,2}}{T_1 T_2} + \\ & \frac{(1 - T_1 - T_1 T_2 + T_1^2 T_2) p_{3,5} x_{1,5} x_{2,5}}{T_1 T_2} + (1 - T_1 - T_2 + T_1 T_2) p_{3,6} x_{1,5} x_{2,5} + \\ & \frac{(T_2 - 2 T_1 T_2 + T_1^2 T_2) p_{3,6} x_{1,6} x_{2,5}}{T_1} + \frac{(-1 + T_1 + T_1 T_2 - T_1^2 T_2) p_{3,5} x_{1,5} x_{2,6}}{T_1} + \\ & \frac{(1 - T_1 + T_2 - T_1 T_2 - 2 T_2^2 + 2 T_1 T_2^2) p_{3,6} x_{1,5} x_{2,6}}{T_2} + \\ & \frac{(-1 + 2 T_1 - T_1^2 - T_2 + 2 T_1 T_2 - T_1^2 T_2 + T_2^2 - 2 T_1 T_2^2 + T_1^2 T_2^2) p_{3,6} x_{1,6} x_{2,6}}{T_1 T_2} \end{aligned}$$