Pensieve header: Perturbed Alexander-Burau Invariants. Continues Pensieve://2021-12/, but with the perturbation placed ahead of the bulk.

Programs

```
In[•]:= Once[<< KnotTheory`];
```

```
Loading KnotTheory` version of February 2, 2020, 10:53:45.2097.
Read more at http://katlas.org/wiki/KnotTheory.
```

```
In[•]:= PD[GST48] = PD[X[1, 15, 2, 14], X[29, 2, 30, 3], X[40, 4, 41, 3],
    X[4, 44, 5, 43], X[5, 26, 6, 27], X[95, 7, 96, 6], X[7, 1, 8, 96], X[8, 14, 9, 13],
    X[28, 9, 29, 10], X[41, 11, 42, 10], X[11, 43, 12, 42], X[12, 27, 13, 28],
    X[15, 31, 16, 30], X[61, 16, 62, 17], X[72, 17, 73, 18], X[83, 18, 84, 19],
    X[34, 20, 35, 19], X[20, 89, 21, 90], X[92, 21, 93, 22], X[22, 79, 23, 80],
    X[23, 68, 24, 69], X[24, 57, 25, 58], X[56, 25, 57, 26], X[31, 63, 32, 62],
    X[32, 74, 33, 73], X[33, 85, 34, 84], X[35, 50, 36, 51], X[81, 37, 82, 36],
    X[70, 38, 71, 37], X[59, 39, 60, 38], X[54, 39, 55, 40], X[55, 45, 56, 44],
    X[45, 59, 46, 58], X[46, 70, 47, 69], X[47, 81, 48, 80], X[91, 49, 92, 48],
    X[49, 91, 50, 90], X[82, 52, 83, 51], X[71, 53, 72, 52], X[60, 54, 61, 53],
    X[74, 63, 75, 64], X[85, 64, 86, 65], X[65, 76, 66, 77], X[66, 87, 67, 88],
    X[94, 67, 95, 68], X[86, 75, 87, 76], X[77, 88, 78, 89], X[93, 78, 94, 79]];
```

```
In[•]:= ThinPosition[K_] := Module[{todo, done, pd, c},
   todo = List @@ PD@K; done = {}; pd = PD[];
   While[todo =!= {},
    AppendTo[pd, c = RandomChoice@MaximalBy[todo, Length[done ⋂ List @@ #] &]];
    todo = DeleteCases[todo, c];
    done = done ⋃ List @@ c];
   pd ]
```

```
In[•]:= RVK::usage =
   "RVK[xs, rots] represents a Rotational Virtual Knot with a list of n Xp/Xm crossings
     xs and a length 2n list of rotation numbers rots. Crossing
     sites are indexed 1 through 2n, and rots⟦k⟧ is the rotation
     between site k-1 and site k. RVK is also a casting operator
     converting to the RVK presentation from other knot presentations.";
```

In[∘]:=
```
RVK[pd_PD] := Module[{n, xs, x, rots, front = {1}, k},
   n = Length@pd; rots = Table[0, {2 n}];
   xs = Cases[pd, x_X :> { Xp[x⟦4⟧, x⟦1⟧]  PositiveQ@x
                           Xm[x⟦2⟧, x⟦1⟧]  True      ];
   For[k = 1, k ≤ 2 n, ++k,
    If[FreeQ[front, -k],
     front = Flatten@Replace[front, k → (xs /. {
           Xp[k, l_] | Xm[l_, k] :> {l + 1, k + 1, -l},
           Xp[l_, k] | Xm[k, l_] :> (++rots⟦l⟧; {-l, k + 1, l + 1}),
           _Xp | _Xm :> {}
          }), {1}],
     Cases[front, k | -k] /. {k, -k} :> --rots⟦k⟧;
    ]
   ];
   RVK[xs, rots] ];
RVK[K_] := RVK[PD[K]];
```

In[∘]:=
```
rot_i_[n_] := (*rot_i[n]=*) { η_i                       n == 0
                              C_$ rot_i[n - 1] // m_{i,$→i}  n > 0
                              C̄_$ rot_i[n + 1] // m_{i,$→i}  n < 0
```

In[∘]:=
```
Z[K_] := Z[RVK@K];
Z[rvk_RVK] := Module[{ξ, done, st, c, χ, i, j, k},
  ξ = 1; done = {}; st = Range[2 Length[rvk⟦1⟧]];
  Do[
   {i, j} = List @@ c;
   χ = c /. {_Xp :> R_{i,j}, _Xm :> R̄_{i,j}};
   Do[χ = (rot_0[rvk⟦2, k⟧] χ) // m_{0,k→k}, {k, {i, j}}];
   ξ *= χ;
   Do[
    If[MemberQ[done, k + 1], ξ = ξ // m_{k,k+1→k}; st = st /. k + 1 → k];
    If[MemberQ[done, k - 1], ξ = ξ // m_{st⟦k-1⟧,k→st⟦k-1⟧}; st = st /. k → st⟦k - 1⟧],
    {k, {i, j}}];
   done = done ⋃ {i, j},
   {c, rvk⟦1⟧}
  ];
  Factor@ξ
 ]
```

In[∘]:=
```
ZF[K_] := Z@ThinPosition@K;
```

In[∘]:=
```
$k=1;
```

In[∘]:=
```
CCF[ℰ_] := ExpandDenominator@ExpandNumerator@Together[ℰ];
```

In[∘]:=
```
CF[ℰ_List] := CF /@ ℰ;
CF[ℰ_ϵSeries] := CF /@ ℰ;
CF[ℰ_] := Module[
   {vs = Cases[ℰ, (p | x | π | ξ)_, ∞] ⋃ {p | x | π | ξ}},
   Total[CoefficientRules[Expand[ℰ], vs] /. (ps_ → c_) ⧴ CCF[c] (Times @@ vs^ps)]
  ];
CF[ℰ_𝔼] := CF /@ ℰ;
CF[γ_Γ] := CF /@ γ;
CF[𝔼_sp___[ℰs___]] := CF /@ 𝔼_sp[ℰs];
```

In[∘]:=
```
ϵSeries /: S1_ϵSeries ≡ S2_ϵSeries :=
  Length[S1] == Length[S2] ∧ Inner[CF[#1] == CF[#2] &, S1, S2, And];
ϵSeries[0] := ϵSeries @@ Table[0, $k + 1];
ϵSeries /: S1_ϵSeries + S2_ϵSeries :=
  ϵSeries @@ Table[S1⟦k⟧ + S2⟦k⟧, {k, Min[Length@S1, Length@S2]}];
ϵSeries /: S1_ϵSeries * S2_ϵSeries := ϵSeries @@
   Table[Sum[S1⟦j + 1⟧ * S2⟦k - j + 1⟧, {j, 0, k}], {k, 0, Min[Length@S1, Length@S2] - 1}];
ϵSeries /: c_ * S_ϵSeries := (c #) & /@ S;
ϵSeries /: ∂_vs___ S_ϵSeries := (s ↦ ∂_vs s) /@ S;
```

In[∘]:=
```
{p*, x*, π*, ξ*} = {π, ξ, p, x};
(vs_List)* := (v ↦ v*) /@ vs;
(u_i_)* := (u*)_i;
```

In[∘]:=
```
𝔼 /: 𝔼[ω1_, Q1_, P1_] ≡ 𝔼[ω2_, Q2_, P2_] := CF[ω1 == ω2] ∧ CF[Q1 == Q2] ∧ (P1 ≡ P2);
𝔼 /: 𝔼[ω1_, Q1_, P1_] 𝔼[ω2_, Q2_, P2_] := 𝔼[ω1 ω2, Q1 + Q2, P1 + P2];
𝔼_d1_→r1_[ℰ1s___] ≡ 𝔼_d2_→r2_[ℰ2s___] ^:= (d1 == d2) ∧ (r1 == r2) ∧ (𝔼[ℰ1s] ≡ 𝔼[ℰ2s]);
𝔼_d1_→r1_[ℰ1s___] 𝔼_d2_→r2_[ℰ2s___] ^:= 𝔼_(d1⋃d2)→(r1⋃r2) @@ (𝔼[ℰ1s] 𝔼[ℰ2s]);
```

In[∘]:=
```
Zip1_{} = Identity;
Zip1_vs_ @⟨ℱ_, 𝔼[ω_, Q_, P_]⟩ := Module[{ℐ, F, G, u, v},
  ℐ = IdentityMatrix@Length@vs;
  F = Table[∂_u,v ℱ, {u, vs*}, {v, vs*}];
  G = Table[∂_u,v Q, {u, vs}, {v, vs}];
  CF /@ ⟨
    vs*.F.Inverse[ℐ - G.F].vs* / 2,
    𝔼[PowerExpand@Factor[ω Det[ℐ - G.F]^(-1/2)], Q - vs.G.vs / 2, P]
   ⟩
 ]
```

In[ ]:=
```
Zip2{} = Identity;
Zip2vs_ @⟨ℱ_, 𝔼[ω_, Q_, P_]⟩ := Module[{F, Y, u, v},
  F = Table[∂u,v ℱ, {u, vs*}, {v, vs*}];
  Y = Table[∂v Q, {v, vs}];
  CF /@ ⟨ℱ, 𝔼[ω, Q - Y.vs + Y.F.Y / 2, P /. Thread[vs → vs + F.Y]]⟩
 ]
```

In[ ]:=
```
Zip3vs_ @⟨ℱ_, 𝔼[ω_, Q_, P_]⟩ := Module[{Z, u, v, m, j},
  Z[0] = P;
  For[m = 0, m < 2 $k, ++m,
   Z[m + 1] = CF[1/(2 (m + 1))
      Sum[∂u*,v* ℱ (∂u,v Z[m] + Sum[(∂u Z[j]) (∂v Z[m - j]), {j, 0, m}]), {u, vs}, {v, vs}]]
  ];
  𝔼[ω, Q, CF[Sum[Z[m], {m, 0, 2 $k}] /. Table[v → 0, {v, vs}]]]
 ]
```

In[ ]:=
```
Zipvs_ [ℱ_, ℰ_] := ⟨ℱ, ℰ⟩ // Zip1vs // Zip2vs // Zip3vs
```

In[ ]:=
```
𝔼d1_→r1_ [ℰ1s___] // 𝔼d2_→r2_ [ℰ2s___] := Module[{is = r1 ⋂ d2, lvs},
  lvs = Flatten@Table[{x$@i, p$@i}, {i, is}];
  𝔼(d1⋃Complement[d2,is])→(r2⋃Complement[r1,is]) @@ (Ziplvs⋃lvs* [lvs*.lvs, Times[
      𝔼[ℰ1s] /. Table[(v : x | p)i → v$@i, {i, is}],
      𝔼[ℰ2s] /. Table[(v : ξ | π)i → v$@i, {i, is}]
     ]])
 ]
```

In[ ]:=
```
ηi_ := 𝔼{}→{i}[1, 0, ϵSeries[0]];
mi_,j_→k_ := 𝔼{i,j}→{k}[1, -ξi πj + (πi + πj) pk + (ξi + ξj) xk, ϵSeries[0]]
```

In[ ]:=
```
AllMonomials[{}, 0] = {1};
AllMonomials[{}, d_Integer] /; d > 0 := {};
AllMonomials[{v_, vs___}, d_Integer] :=
  Join @@ Table[v^(d-k) AllMonomials[{vs}, k], {k, 0, d}];
AllMonomials[vs_List, {d_}] := Join @@ Table[AllMonomials[vs, k], {k, 0, d}];
```

In[ ]:=
```
Basis[js_List, m_] := Flatten@Outer[Times,
    AllMonomials[Table[pj, {j, js}], m], AllMonomials[Table[xj, {j, js}], m]];
Basis[js_List, {m_}] := Flatten@Table[Basis[js, k], {k, 0, m}]
```

```
In[•]:= GenericCombination[bas_, c_] := bas.Table[c_j, {j, Length@bas}];
        GenericCombination[bas_, c_k_] := bas.Table[c_k,j, {j, Length@bas}];

In[•]:= R0_i_,j_ := 𝔼_{}→{i,j}[T^(1/2), (T - 1) (p_i - p_j) x_j , ϵSeries @@ Table[0, $k + 1]];
        Rp_i_,j_ := 𝔼_{}→{i,j}[1, 0,
          ϵSeries @@ Prepend[0]@Table[GenericCombination[Basis[{i, j}, {k + 1}], c_k], {k, $k}]];
        R_i_,j_ := Module[{i1, j1}, Rp_i1,j1 R0_i,j // m_i1,i→i // m_j1,j→j];

In[•]:= R̄0_i_,j_ := 𝔼_{}→{i,j}[T^(-1/2), (T^-1 - 1) (p_i - p_j) x_j , ϵSeries @@ Table[0, $k + 1]];
        R̄p_i_,j_ := 𝔼_{}→{i,j}[1, 0,
          ϵSeries @@ Prepend[0]@Table[GenericCombination[Basis[{i, j}, {k + 1}], d_k], {k, $k}]];
        R̄_i_,j_ := Module[{i1, j1}, R̄p_i1,j1 R̄0_i,j // m_i1,i→i // m_j1,j→j];

In[•]:= C_i_ := 𝔼_{}→{i}[T^(1/2), 0,
           ϵSeries @@ Prepend[0]@Table[GenericCombination[Basis[{i}, {k + 1}], e_k], {k, $k}]];
        C̄_i_ := 𝔼_{}→{i}[T^(-1/2), 0,
           ϵSeries @@ Prepend[0]@Table[GenericCombination[Basis[{i}, {k + 1}], f_k], {k, $k}]];
```

In[ ]:= $\mathrm{CF}\ /@\ \{R_{1,2},\ \overline{R}_{1,2},\ C_1,\ \overline{C}_1\}$

Out[ ]=

$$\Big\{\mathbb{E}_{\{\}\to\{1,2\}}\Big[\sqrt{T},\ (-1+T)\,p_1 x_2 + (1-T)\,p_2 x_2,$$
$$\epsilon\mathrm{Series}\Big[0,\ c_{1,1} + p_1 x_1 c_{1,2} + p_1 x_2\,(c_{1,2} - T c_{1,2} + T c_{1,3}) + p_2 x_1 c_{1,4} +$$
$$p_2 x_2\,(c_{1,4} - T c_{1,4} + T c_{1,5}) + p_1^2 x_1^2 c_{1,6} + p_1^2 x_1 x_2\,(2 c_{1,6} - 2 T c_{1,6} + T c_{1,7}) +$$
$$p_1^2 x_2^2\,\big(c_{1,6} - 2 T c_{1,6} + T^2 c_{1,6} + T c_{1,7} - T^2 c_{1,7} + T^2 c_{1,8}\big) + p_1 p_2 x_1^2 c_{1,9} +$$
$$p_1 p_2 x_1 x_2\,(2 c_{1,9} - 2 T c_{1,9} + T c_{1,10}) + p_1 p_2 x_2^2\,\big(c_{1,9} - 2 T c_{1,9} + T^2 c_{1,9} + T c_{1,10} - T^2 c_{1,10} + T^2 c_{1,11}\big) +$$
$$p_2^2 x_1^2 c_{1,12} + p_2^2 x_1 x_2\,(2 c_{1,12} - 2 T c_{1,12} + T c_{1,13}) +$$
$$p_2^2 x_2^2\,\big(c_{1,12} - 2 T c_{1,12} + T^2 c_{1,12} + T c_{1,13} - T^2 c_{1,13} + T^2 c_{1,14}\big)\Big]\Big],$$

$$\mathbb{E}_{\{\}\to\{1,2\}}\Big[\frac{1}{\sqrt{T}},\ \frac{(1-T)\,p_1 x_2}{T} + \frac{(-1+T)\,p_2 x_2}{T},$$
$$\epsilon\mathrm{Series}\Big[0,\ d_{1,1} + p_1 x_1 d_{1,2} + \frac{p_1 x_2\,(-d_{1,2} + T d_{1,2} + d_{1,3})}{T} + p_2 x_1 d_{1,4} + \frac{p_2 x_2\,(-d_{1,4} + T d_{1,4} + d_{1,5})}{T} +$$
$$p_1^2 x_1^2 d_{1,6} + \frac{p_1^2 x_1 x_2\,(-2 d_{1,6} + 2 T d_{1,6} + d_{1,7})}{T} + \frac{p_1^2 x_2^2\,\big(d_{1,6} - 2 T d_{1,6} + T^2 d_{1,6} - d_{1,7} + T d_{1,7} + d_{1,8}\big)}{T^2} +$$
$$p_1 p_2 x_1^2 d_{1,9} + \frac{p_1 p_2 x_1 x_2\,(-2 d_{1,9} + 2 T d_{1,9} + d_{1,10})}{T} +$$
$$\frac{p_1 p_2 x_2^2\,\big(d_{1,9} - 2 T d_{1,9} + T^2 d_{1,9} - d_{1,10} + T d_{1,10} + d_{1,11}\big)}{T^2} + p_2^2 x_1^2 d_{1,12} +$$
$$\frac{p_2^2 x_1 x_2\,(-2 d_{1,12} + 2 T d_{1,12} + d_{1,13})}{T} + \frac{p_2^2 x_2^2\,\big(d_{1,12} - 2 T d_{1,12} + T^2 d_{1,12} - d_{1,13} + T d_{1,13} + d_{1,14}\big)}{T^2}\Big]\Big],$$

$$\mathbb{E}_{\{\}\to\{1\}}\Big[\sqrt{T},\ 0,\ \epsilon\mathrm{Series}\big[0,\ e_{1,1} + p_1 x_1 e_{1,2} + p_1^2 x_1^2 e_{1,3}\big]\Big],$$
$$\mathbb{E}_{\{\}\to\{1\}}\Big[\frac{1}{\sqrt{T}},\ 0,\ \epsilon\mathrm{Series}\big[0,\ f_{1,1} + p_1 x_1 f_{1,2} + p_1^2 x_1^2 f_{1,3}\big]\Big]\Big\}$$

In[ ]:=

$$\mathrm{RMoves} := \{$$
$$(R_{1,2}\, R_{4,3}\, R_{5,6}\ //\ m_{1,4\to1}\ //\ m_{2,5\to2}\ //\ m_{3,6\to3}) \equiv (R_{2,3}\, R_{4,5}\, R_{1,6}\ //\ m_{1,4\to1}\ //\ m_{2,5\to2}\ //\ m_{3,6\to3}),$$
$$(R_{1,2}\, \overline{R}_{3,4}\ //\ m_{1,3\to1}\ //\ m_{2,4\to2}) \equiv (\eta_1\, \eta_2),$$
$$(C_1\, \overline{C}_2\ //\ m_{1,2\to1}) \equiv \eta_1,$$
$$(R_{1,4}\, \overline{R}_{5,2}\, \overline{C}_3\ //\ m_{2,4\to2}\ //\ m_{1,3\to1}\ //\ m_{1,5\to1}) \equiv \overline{C}_1\, \eta_2,$$
$$(C_3\, R_{1,2}\ //\ m_{2,3\to2}\ //\ m_{2,1\to1}) \equiv (\overline{C}_3\, R_{1,2}\ //\ m_{1,3\to1}\ //\ m_{1,2\to1}),$$
$$(\overline{C}_2\, R_{1,3}\ //\ m_{1,2\to1}\ //\ m_{1,3\to1}) \equiv \eta_1,\ (\overline{C}_2\, \overline{R}_{3,1}\ //\ m_{1,2\to1}\ //\ m_{1,3\to1}) \equiv \eta_1,$$
$$(C_2\, \overline{R}_{1,3}\ //\ m_{1,2\to1}\ //\ m_{1,3\to1}) \equiv \eta_1,\ (C_2\, R_{3,1}\ //\ m_{1,2\to1}\ //\ m_{1,3\to1}) \equiv \eta_1$$
$$\}$$

In[•]:= **Short[RMoves, 10]**

Out[•]//Short=

$\{3\, c_{1,1} + 2\, p_1\, x_1\, c_{1,2} + p_2\, x_1\, c_{1,4} + p_3\, x_1\, c_{1,4} + \ll 34 \gg +$
$p_2^2\, x_3^2\, (T^2\, c_{1,6} - 2\, T^3\, c_{1,6} + T^4\, c_{1,6} + T^3\, c_{1,7} - T^4\, c_{1,7} + T^4\, c_{1,8} + c_{1,12} - 2\, T\, c_{1,12} +$
$T^2\, c_{1,12} + T\, c_{1,13} - 2\, T^2\, c_{1,13} + T^3\, c_{1,13} + T^2\, c_{1,14} - 2\, T^3\, c_{1,14} + T^4\, c_{1,14}) +$
$p_1^2\, x_3^2\, (2\, c_{1,6} - 6\, T\, c_{1,6} + 8\, T^2\, c_{1,6} - 6\, T^3\, c_{1,6} + 2\, T^4\, c_{1,6} + 2\, T\, c_{1,7} - 5\, T^2\, c_{1,7} + 5\, T^3\, c_{1,7} -$
$2\, T^4\, c_{1,7} + 2\, T^2\, c_{1,8} - 4\, T^3\, c_{1,8} + 3\, T^4\, c_{1,8} + c_{1,9} - 4\, T\, c_{1,9} + 6\, T^2\, c_{1,9} - 4\, T^3\, c_{1,9} + T^4\, c_{1,9} + T\, c_{1,10} -$
$3\, T^2\, c_{1,10} + 3\, T^3\, c_{1,10} - T^4\, c_{1,10} + T^2\, c_{1,11} - 2\, T^3\, c_{1,11} + T^4\, c_{1,11} + c_{1,12} - 4\, T\, c_{1,12} + 6\, T^2\, c_{1,12} -$
$4\, T^3\, c_{1,12} + T^4\, c_{1,12} + T\, c_{1,13} - 3\, T^2\, c_{1,13} + 3\, T^3\, c_{1,13} - T^4\, c_{1,13} + T^2\, c_{1,14} - 2\, T^3\, c_{1,14} + T^4\, c_{1,14}) +$
$p_3^2\, x_3^2\, (2\, T^2\, c_{1,12} - 4\, T^3\, c_{1,12} + 2\, T^4\, c_{1,12} + 2\, T^3\, c_{1,13} - 2\, T^4\, c_{1,13} + 2\, T^4\, c_{1,14}) ==$
$3\, c_{1,1} + 2\, p_1\, x_1\, c_{1,2} + p_1\, x_2\, (\ll 1 \gg) + \ll 41 \gg + p_2^2\, x_3^2\, (\ll 1 \gg) + p_3^2\, x_3^2\, (\ll 1 \gg),$
$\ll 7 \gg, \ll 1 \gg\}$

Solving for *R*, *C*, \$k = 1

In[•]:= **\$k = 1;**
{R

Out[•]= $\{\mathbb{E}_{\{\}\to\{1,2\}}[\sqrt{T}, (-1 + T)\, p_1\, x_2 + (1 - T)\, p_2\, x_2,$
$\in\text{Series}[0, c_{1,1} + p_1\, x_1\, c_{1,2} + p_1\, x_2\, (c_{1,2} - T\, c_{1,2} + T\, c_{1,3}) + p_2\, x_1\, c_{1,4} +$
$p_2\, x_2\, (c_{1,4} - T\, c_{1,4} + T\, c_{1,5}) + p_1^2\, x_1^2\, c_{1,6} + p_1^2\, x_1\, x_2\, (2\, c_{1,6} - 2\, T\, c_{1,6} + T\, c_{1,7}) +$
$p_1^2\, x_2^2\, (c_{1,6} - 2\, T\, c_{1,6} + T^2\, c_{1,6} + T\, c_{1,7} - T^2\, c_{1,7} + T^2\, c_{1,8}) + p_1\, p_2\, x_1^2\, c_{1,9} +$
$p_1\, p_2\, x_1\, x_2\, (2\, c_{1,9} - 2\, T\, c_{1,9} + T\, c_{1,10}) + p_1\, p_2\, x_2^2\, (c_{1,9} - 2\, T\, c_{1,9} + T^2\, c_{1,9} + T\, c_{1,10} - T^2\, c_{1,10} + T^2\, c_{1,11}) +$
$p_2^2\, x_1^2\, c_{1,12} + p_2^2\, x_1\, x_2\, (2\, c_{1,12} - 2\, T\, c_{1,12} + T\, c_{1,13}) +$
$p_2^2\, x_2^2\, (c_{1,12} - 2\, T\, c_{1,12} + T^2\, c_{1,12} + T\, c_{1,13} - T^2\, c_{1,13} + T^2\, c_{1,14})]],$
$\mathbb{E}_{\{\}\to\{1\}}[\sqrt{T}, 0, \in\text{Series}[0, e_{1,1} + p_1\, x_1\, e_{1,2} + p_1^2\, x_1^2\, e_{1,3}]]\}$

Out[•]= $\{c_{1,1}, c_{1,2}, c_{1,3}, c_{1,4}, c_{1,5}, c_{1,6}, c_{1,7}, c_{1,8}, c_{1,9}, c_{1,10}, c_{1,11}, c_{1,12}, c_{1,13}, c_{1,14}, d_{1,1}, d_{1,2}, d_{1,3},$
$d_{1,4}, d_{1,5}, d_{1,6}, d_{1,7}, d_{1,8}, d_{1,9}, d_{1,10}, d_{1,11}, d_{1,12}, d_{1,13}, d_{1,14}, e_{1,1}, e_{1,2}, e_{1,3}, f_{1,1}, f_{1,2}, f_{1,3}\}$

In[ ]:=
```
Short[errors = CCF /@ Cases[RMoves, a_ == b_ :> a - b], 25]
```

Out[ ]//Short=

$$\{p_1 x_3 c_{1,2} - T p_1 x_3 c_{1,2} + T p_1 x_3 c_{1,3} - T^2 p_1 x_3 c_{1,3} - p_2 x_1 c_{1,4} + T p_2 x_1 c_{1,4} + p_3 x_1 c_{1,4} - T p_3 x_1 c_{1,4} +$$
$$p_1 x_2 c_{1,4} - T p_1 x_2 c_{1,4} - p_2 x_2 c_{1,4} + 2 T p_2 x_2 c_{1,4} - T^2 p_2 x_2 c_{1,4} - T p_3 x_2 c_{1,4} + T^2 p_3 x_2 c_{1,4} +$$
$$p_1 x_3 c_{1,4} - 2 T p_1 x_3 c_{1,4} + T^2 p_1 x_3 c_{1,4} + T p_2 x_3 c_{1,4} - T^2 p_2 x_3 c_{1,4} + T p_1 x_3 c_{1,5} - T^2 p_1 x_3 c_{1,5} -$$
$$2 p_1^2 x_1 x_2 c_{1,6} + 2 T p_1^2 x_1 x_2 c_{1,6} + 2 T p_1 p_2 x_2^2 c_{1,6} - 2 T^2 p_1 p_2 x_2^2 c_{1,6} + 2 T p_1^2 x_1 x_3 c_{1,6} -$$
$$2 T^2 p_1^2 x_1 x_3 c_{1,6} + 2 p_1^2 x_2 x_3 c_{1,6} - 6 T p_1^2 x_2 x_3 c_{1,6} + 6 T^2 p_1^2 x_2 x_3 c_{1,6} - 2 T^3 p_1^2 x_2 x_3 c_{1,6} +$$
$$4 T p_1 p_2 x_2 x_3 c_{1,6} - 8 T^2 p_1 p_2 x_2 x_3 c_{1,6} + 4 T^3 p_1 p_2 x_2 x_3 c_{1,6} + p_1^2 x_3^2 c_{1,6} - 4 T p_1^2 x_3^2 c_{1,6} +$$
$$7 T^2 p_1^2 x_3^2 c_{1,6} - 6 T^3 p_1^2 x_3^2 c_{1,6} + 2 T^4 p_1^2 x_3^2 c_{1,6} + 2 T p_1 p_2 x_3^2 c_{1,6} - 6 T^2 p_1 p_2 x_3^2 c_{1,6} + 6 T^3 p_1 p_2 x_3^2 c_{1,6} -$$
$$2 T^4 p_1 p_2 x_3^2 c_{1,6} + 2 T p_1^2 x_2 x_3 c_{1,7} - 4 T^2 p_1^2 x_2 x_3 c_{1,7} + 2 T^3 p_1^2 x_2 x_3 c_{1,7} + \ll 207 \gg + 6 T^3 p_1 p_3 x_3^2 c_{1,12} -$$
$$2 T^4 p_1 p_3 x_3^2 c_{1,12} - 2 T p_2 p_3 x_3^2 c_{1,12} + 6 T^2 p_2 p_3 x_3^2 c_{1,12} - 6 T^3 p_2 p_3 x_3^2 c_{1,12} + 2 T^4 p_2 p_3 x_3^2 c_{1,12} +$$
$$T^2 p_2^2 x_1 x_3 c_{1,13} - T^3 p_2^2 x_1 x_3 c_{1,13} - 2 T^2 p_2 p_3 x_1 x_3 c_{1,13} + 2 T^3 p_2 p_3 x_1 x_3 c_{1,13} + T^2 p_3^2 x_1 x_3 c_{1,13} -$$
$$T^3 p_3^2 x_1 x_3 c_{1,13} + T p_1^2 x_2 x_3 c_{1,13} - 2 T^2 p_1^2 x_2 x_3 c_{1,13} + T^3 p_1^2 x_2 x_3 c_{1,13} + T p_2^2 x_2 x_3 c_{1,13} -$$
$$2 T^3 p_2^2 x_2 x_3 c_{1,13} + T^4 p_2^2 x_2 x_3 c_{1,13} + 2 T^2 p_1 p_3 x_2 x_3 c_{1,13} - 2 T^3 p_1 p_3 x_2 x_3 c_{1,13} - 2 T^2 p_2 p_3 x_2 x_3 c_{1,13} +$$
$$4 T^3 p_2 p_3 x_2 x_3 c_{1,13} - 2 T^4 p_2 p_3 x_2 x_3 c_{1,13} - T^3 p_3^2 x_2 x_3 c_{1,13} + T^4 p_3^2 x_2 x_3 c_{1,13} + T p_1^2 x_3^2 c_{1,13} -$$
$$3 T^2 p_1^2 x_3^2 c_{1,13} + 3 T^3 p_1^2 x_3^2 c_{1,13} - T^4 p_1^2 x_3^2 c_{1,13} + T^2 p_2^2 x_3^2 c_{1,13} - 2 T^3 p_2^2 x_3^2 c_{1,13} + T^4 p_2^2 x_3^2 c_{1,13} +$$
$$2 T^2 p_1 p_3 x_3^2 c_{1,13} - 4 T^3 p_1 p_3 x_3^2 c_{1,13} + 2 T^4 p_1 p_3 x_3^2 c_{1,13} - 2 T^2 p_2 p_3 x_3^2 c_{1,13} + 4 T^3 p_2 p_3 x_3^2 c_{1,13} -$$
$$2 T^4 p_2 p_3 x_3^2 c_{1,13} + 2 T^2 p_2^2 x_2 x_3 c_{1,14} - 2 T^3 p_2^2 x_2 x_3 c_{1,14} + T^2 p_1^2 x_3^2 c_{1,14} - 2 T^3 p_1^2 x_3^2 c_{1,14} + T^4 p_1^2 x_3^2 c_{1,14} +$$
$$2 T^3 p_1 p_3 x_3^2 c_{1,14} - 2 T^4 p_1 p_3 x_3^2 c_{1,14} - 2 T^3 p_2 p_3 x_3^2 c_{1,14} + 2 T^4 p_2 p_3 x_3^2 c_{1,14}, \ll 7 \gg, \frac{\ll 1 \gg}{\ll 1 \gg}\}$$

In[ ]:=
```
Short[
 eqns =
  Thread[0 == Union @@ (CoefficientRules[#, {x1, x2, x3, p1, p2, p3}][[;; , 2]] & /@ errors)],
 10]
```

Out[ ]//Short=

$$\{0 == c_{1,4} - T c_{1,4}, 0 == -c_{1,4} + T c_{1,4}, 0 == T c_{1,4} - T^2 c_{1,4},$$
$$0 == -c_{1,4} + 2 T c_{1,4} - T^2 c_{1,4}, 0 == -T c_{1,4} + T^2 c_{1,4}, \ll 74 \gg,$$
$$0 == -c_{1,6} + \frac{c_{1,6}}{T^2} + \frac{c_{1,7}}{T} - T c_{1,7} + c_{1,8} - T^2 c_{1,8} - c_{1,9} + \frac{c_{1,9}}{T^2} + \frac{c_{1,10}}{T} - T c_{1,10} +$$
$$c_{1,11} - T^2 c_{1,11} - c_{1,12} + \frac{c_{1,12}}{T^2} + \frac{c_{1,13}}{T} - T c_{1,13} + c_{1,14} - T^2 c_{1,14} + \frac{e_{1,3}}{T^2} - T^2 f_{1,3},$$
$$0 == c_{1,6} + T c_{1,7} + T^2 c_{1,8} + c_{1,9} + T c_{1,10} + T^2 c_{1,11} + c_{1,12} + T c_{1,13} + T^2 c_{1,14} + T^2 f_{1,3},$$
$$0 == T^2 d_{1,6} + T d_{1,7} + d_{1,8} + T^2 d_{1,9} + T d_{1,10} + d_{1,11} + T^2 d_{1,12} + T d_{1,13} + d_{1,14} + T^2 f_{1,3},$$
$$0 == T^2 c_{1,8} - T c_{1,11} + T^2 c_{1,11} + c_{1,14} - 2 T c_{1,14} + T^2 c_{1,14} + d_{1,6} - 2 T d_{1,6} + T^2 d_{1,6} - d_{1,7} +$$
$$T d_{1,7} + d_{1,8} + f_{1,3} - 2 T f_{1,3} + T^2 f_{1,3}, 0 == d_{1,1} + d_{1,2} - T d_{1,2} - d_{1,3} + 2 d_{1,6} - 4 T d_{1,6} +$$
$$2 T^2 d_{1,6} - 2 d_{1,7} + 2 T d_{1,7} + 2 d_{1,8} + f_{1,1} + f_{1,2} - T f_{1,2} + 2 f_{1,3} - 4 T f_{1,3} + 2 T^2 f_{1,3}\}$$

In[∘]:= `{sol} = Solve[eqns, unknowns]`

Solve: Equations may not give solutions for all "solve" variables.

Out[∘]=
$$\left\{\left\{c_{1,1}\to -\frac{c_{1,2}}{2}-\frac{c_{1,5}}{2},\ c_{1,3}\to -\frac{c_{1,2}}{T}-c_{1,5},\ c_{1,4}\to 0,\ c_{1,6}\to 0,\ c_{1,8}\to -\frac{(1-T)\ c_{1,7}}{T}-\frac{(1-T)\ c_{1,10}}{2\,T},\right.\right.$$
$$c_{1,9}\to 0,\ c_{1,11}\to -c_{1,7}-\frac{(1+T)\ c_{1,10}}{2\,T},\ c_{1,12}\to 0,\ c_{1,13}\to 0,\ c_{1,14}\to 0,$$
$$d_{1,1}\to \frac{c_{1,2}}{2}+\frac{c_{1,5}}{2},\ d_{1,2}\to -c_{1,2},\ d_{1,3}\to T\,c_{1,2}+c_{1,5},\ d_{1,4}\to 0,\ d_{1,5}\to -c_{1,5},\ d_{1,6}\to 0,$$
$$d_{1,7}\to -T\,c_{1,7}-(-1+T)\ c_{1,10},\ d_{1,8}\to -\left(\left(T-T^2\right)\ c_{1,7}\right)-\frac{1}{2}\ \left(-1+3\,T-2\,T^2\right)\ c_{1,10},$$
$$d_{1,9}\to 0,\ d_{1,10}\to -c_{1,10},\ d_{1,11}\to T\,c_{1,7}-\frac{1}{2}\ (1-3\,T)\ c_{1,10},\ d_{1,12}\to 0,\ d_{1,13}\to 0,\ d_{1,14}\to 0,$$
$$\left.\left.e_{1,1}\to -\frac{c_{1,2}}{2}-\frac{c_{1,5}}{2},\ e_{1,2}\to -c_{1,10},\ e_{1,3}\to 0,\ f_{1,1}\to \frac{c_{1,2}}{2}+\frac{c_{1,5}}{2},\ f_{1,2}\to c_{1,10},\ f_{1,3}\to 0\right\}\right\}$$

In[∘]:= `sol /. (a_ → b_) :> (a = b)`

Out[∘]=
$$\left\{-\frac{c_{1,2}}{2}-\frac{c_{1,5}}{2},\ -\frac{c_{1,2}}{T}-c_{1,5},\ 0,\ 0,\ -\frac{(1-T)\ c_{1,7}}{T}-\frac{(1-T)\ c_{1,10}}{2\,T},\ 0,\right.$$
$$-c_{1,7}-\frac{(1+T)\ c_{1,10}}{2\,T},\ 0,\ 0,\ 0,\ \frac{c_{1,2}}{2}+\frac{c_{1,5}}{2},\ -c_{1,2},\ T\,c_{1,2}+c_{1,5},\ 0,\ -c_{1,5},\ 0,$$
$$-T\,c_{1,7}-(-1+T)\ c_{1,10},\ -\left(\left(T-T^2\right)\ c_{1,7}\right)-\frac{1}{2}\ \left(-1+3\,T-2\,T^2\right)\ c_{1,10},\ 0,\ -c_{1,10},$$
$$\left.T\,c_{1,7}-\frac{1}{2}\ (1-3\,T)\ c_{1,10},\ 0,\ 0,\ 0,\ -\frac{c_{1,2}}{2}-\frac{c_{1,5}}{2},\ -c_{1,10},\ 0,\ \frac{c_{1,2}}{2}+\frac{c_{1,5}}{2},\ c_{1,10},\ 0\right\}$$

In[∘]:= $\text{CF /@ }\left\{Rp_{1,2},\ \overline{Rp}_{1,2},\ C_1,\ \overline{C}_1\right\}$

Out[∘]=
$$\left\{\mathbb{E}_{\{\}\to\{1,2\}}\left[1,\ 0,\right.\right.$$
$$\in\text{Series}\left[0,\ p_1\,x_1\,c_{1,2}+\frac{1}{2}\ (-c_{1,2}-c_{1,5})+p_2\,x_2\,c_{1,5}+\frac{p_1\,x_2\ (-c_{1,2}-T\,c_{1,5})}{T}+p_1^2\,x_1\,x_2\,c_{1,7}+\right.$$
$$\left.\left.p_1\,p_2\,x_1\,x_2\,c_{1,10}+\frac{p_1\,p_2\,x_2^2\ (-2\,T\,c_{1,7}-c_{1,10}-T\,c_{1,10})}{2\,T}+\frac{p_1^2\,x_2^2\ (-2\,c_{1,7}+2\,T\,c_{1,7}-c_{1,10}+T\,c_{1,10})}{2\,T}\right]\right],$$
$$\mathbb{E}_{\{\}\to\{1,2\}}\left[1,\ 0,\ \in\text{Series}\left[0,\ -p_1\,x_1\,c_{1,2}-p_2\,x_2\,c_{1,5}+\frac{1}{2}\ (c_{1,2}+c_{1,5})+p_1\,x_2\ (T\,c_{1,2}+c_{1,5})-\right.\right.$$
$$p_1\,p_2\,x_1\,x_2\,c_{1,10}+p_1^2\,x_1\,x_2\ (-T\,c_{1,7}+c_{1,10}-T\,c_{1,10})+\frac{1}{2}\ p_1\,p_2\,x_2^2\ (2\,T\,c_{1,7}-c_{1,10}+3\,T\,c_{1,10})+$$
$$\left.\left.\frac{1}{2}\ p_1^2\,x_2^2\ \left(-2\,T\,c_{1,7}+2\,T^2\,c_{1,7}+c_{1,10}-3\,T\,c_{1,10}+2\,T^2\,c_{1,10}\right)\right]\right],$$
$$\mathbb{E}_{\{\}\to\{1\}}\left[\sqrt{T},\ 0,\ \in\text{Series}\left[0,\ \frac{1}{2}\ (-c_{1,2}-c_{1,5})-p_1\,x_1\,c_{1,10}\right]\right],$$
$$\left.\mathbb{E}_{\{\}\to\{1\}}\left[\frac{1}{\sqrt{T}},\ 0,\ \in\text{Series}\left[0,\ \frac{1}{2}\ (c_{1,2}+c_{1,5})+p_1\,x_1\,c_{1,10}\right]\right]\right\}$$

In[∘]:= **Factor /@ CF[Last@ZF@Knot[6, 1] - Last@ZF@Knot[9, 46]]**

KnotTheory: Loading precomputed data in PD4Knots`.

Out[∘]= $\epsilon\text{Series}\left[0, \frac{2\,(-1+T)^2\,(1-4\,T+T^2)\,c_{1,10}}{(-2+T)^2\,(-1+2\,T)^2}\right]$

In[∘]:= **Cases[{$Rp_{1,2}$, $\overline{Rp}_{1,2}$, C_1, $\overline{C}_1$}, (c | d | e | f)$_{\$k,\_}$, ∞] // Union**

Out[∘]= $\{c_{1,2}, c_{1,5}, c_{1,7}, c_{1,10}\}$

In[∘]:= **CF /@ ({$Rp_{1,2}$, $\overline{Rp}_{1,2}$, C_1, $\overline{C}_1$} /. {$c_{1,10}$ → -1 / 2, $c_{1,2}$ → 0, $c_{1,5}$ → 0})**

Out[∘]= $\Big\{\mathbb{E}_{\{\}\to\{1,2\}}\Big[1, 0, \epsilon\text{Series}\Big[0, -\frac{1}{2}\,p_1\,p_2\,x_1\,x_2 + p_1^2\,x_1\,x_2\,c_{1,7} + \frac{p_1\,p_2\,x_2^2\,(1+T-4\,T\,c_{1,7})}{4\,T} + \frac{p_1^2\,x_2^2\,(1-T-4\,c_{1,7}+4\,T\,c_{1,7})}{4\,T}\Big]\Big],$

$\mathbb{E}_{\{\}\to\{1,2\}}\Big[1, 0, \epsilon\text{Series}\Big[0, \frac{1}{2}\,p_1\,p_2\,x_1\,x_2 + \frac{1}{2}\,p_1^2\,x_1\,x_2\,(-1+T-2\,T\,c_{1,7}) + \frac{1}{4}\,p_1\,p_2\,x_2^2\,(1-3\,T+4\,T\,c_{1,7}) + \frac{1}{4}\,p_1^2\,x_2^2\,(-1+3\,T-2\,T^2-4\,T\,c_{1,7}+4\,T^2\,c_{1,7})\Big]\Big],$

$\mathbb{E}_{\{\}\to\{1\}}\Big[\sqrt{T}, 0, \epsilon\text{Series}\Big[0, \frac{p_1\,x_1}{2}\Big]\Big], \mathbb{E}_{\{\}\to\{1\}}\Big[\frac{1}{\sqrt{T}}, 0, \epsilon\text{Series}\Big[0, -\frac{1}{2}\,p_1\,x_1\Big]\Big]\Big\}$

In[∘]:= **CF /@ ({$Rp_{1,2}$, $\overline{Rp}_{1,2}$, C_1, $\overline{C}_1$} /. {$c_{1,10}$ → -1 / 2, $c_{1,2}$ → 0, $c_{1,5}$ → 0, $c_{1,7}$ → 1 / 2})**

Out[∘]= $\Big\{\mathbb{E}_{\{\}\to\{1,2\}}\Big[1, 0, \epsilon\text{Series}\Big[0, \frac{1}{2}\,p_1^2\,x_1\,x_2 - \frac{1}{2}\,p_1\,p_2\,x_1\,x_2 + \frac{(-1+T)\,p_1^2\,x_2^2}{4\,T} + \frac{(1-T)\,p_1\,p_2\,x_2^2}{4\,T}\Big]\Big],$

$\mathbb{E}_{\{\}\to\{1,2\}}\Big[1, 0, \epsilon\text{Series}\Big[0, -\frac{1}{2}\,p_1^2\,x_1\,x_2 + \frac{1}{2}\,p_1\,p_2\,x_1\,x_2 + \frac{1}{4}\,(-1+T)\,p_1^2\,x_2^2 + \frac{1}{4}\,(1-T)\,p_1\,p_2\,x_2^2\Big]\Big],$

$\mathbb{E}_{\{\}\to\{1\}}\Big[\sqrt{T}, 0, \epsilon\text{Series}\Big[0, \frac{p_1\,x_1}{2}\Big]\Big], \mathbb{E}_{\{\}\to\{1\}}\Big[\frac{1}{\sqrt{T}}, 0, \epsilon\text{Series}\Big[0, -\frac{1}{2}\,p_1\,x_1\Big]\Big]\Big\}$

In[∘]:= **{$c_{1,10}$ = -1 / 2, $c_{1,2}$ = 0, $c_{1,5}$ = 0, $c_{1,7}$ = 1 / 2};**
CF /@ {$R_{1,2}$, $\overline{R}_{1,2}$, C_1, $\overline{C}_1$}

Out[∘]= $\Big\{\mathbb{E}_{\{\}\to\{1,2\}}\Big[\sqrt{T}, (-1+T)\,p_1\,x_2 + (1-T)\,p_2\,x_2, \epsilon\text{Series}\Big[0, \frac{1}{2}\,T\,p_1^2\,x_1\,x_2 - \frac{1}{2}\,T\,p_1\,p_2\,x_1\,x_2 + \frac{1}{4}\,(T-T^2)\,p_1^2\,x_2^2 + \frac{1}{4}\,(-T+T^2)\,p_1\,p_2\,x_2^2\Big]\Big],$

$\mathbb{E}_{\{\}\to\{1,2\}}\Big[\frac{1}{\sqrt{T}}, \frac{(1-T)\,p_1\,x_2}{T} + \frac{(-1+T)\,p_2\,x_2}{T}, \epsilon\text{Series}\Big[0, -\frac{p_1^2\,x_1\,x_2}{2\,T} + \frac{p_1\,p_2\,x_1\,x_2}{2\,T} + \frac{(1-T)\,p_1^2\,x_2^2}{4\,T^2} + \frac{(-1+T)\,p_1\,p_2\,x_2^2}{4\,T^2}\Big]\Big],$

$\mathbb{E}_{\{\}\to\{1\}}\Big[\sqrt{T}, 0, \epsilon\text{Series}\Big[0, \frac{p_1\,x_1}{2}\Big]\Big], \mathbb{E}_{\{\}\to\{1\}}\Big[\frac{1}{\sqrt{T}}, 0, \epsilon\text{Series}\Big[0, -\frac{1}{2}\,p_1\,x_1\Big]\Big]\Big\}$

In[∘]:= $\mathrm{CF}\left[R_{1,2}\ /.\ T\to T^{-1}\right]$

Out[∘]= $\mathbb{E}_{\{\}\to\{1,2\}}\left[\sqrt{\frac{1}{T}},\ \frac{(1-T)\,p_1\,x_2}{T}+\frac{(-1+T)\,p_2\,x_2}{T},\ \epsilon\mathrm{Series}\left[0,\ \frac{p_1^2\,x_1\,x_2}{2\,T}-\frac{p_1\,p_2\,x_1\,x_2}{2\,T}+\frac{(-1+T)\,p_1^2\,x_2^2}{4\,T^2}+\frac{(1-T)\,p_1\,p_2\,x_2^2}{4\,T^2}\right]\right]$

In[∘]:= RMoves

Out[∘]= {True, True, True, True, True, True, True, True, True}

The isomorphism with Γ-calculus

In[∘]:= $\Gamma\left[\mathbb{E}_{\{\}\to is\_}[\omega\_,\ Q\_,\ \_]\right]$:= CF@$\Gamma\left[\omega^{-1},\ \mathrm{Sum}[p_i\,x_i,\ \{i,\ is\}]-Q\right]$
$\mathbb{E}[\Gamma[\omega\_,\ A\_]]$:= Module$\left[\{is = \mathrm{Union@Cases}\left[A,\ p_{i_}:\!\to i,\ \infty\right]\},\right.$
CF@$\mathbb{E}_{\{\}\to is}\left[\omega^{-1},\ \mathrm{Sum}[p_i\,x_i,\ \{i,\ is\}]-A,\ \epsilon\mathrm{Series}[0]\right]\Big]$

In[∘]:= $\{R_{i,j},\ R_{i,j}\ //\ \Gamma,\ R_{i,j}\ //\ \Gamma\ //\ \mathbb{E}\}$ // Column

Out[∘]= $\mathbb{E}_{\{\}\to\{i,j\}}\left[\sqrt{T},\ (-1+T)\,p_i\,x_j+(1-T)\,p_j\,x_j,\ \epsilon\mathrm{Series}\left[0,\ \frac{1}{2}\,T\,p_i^2\,x_i\,x_j-\frac{1}{2}\,T\,p_i\,p_j\,x_i\,x_j+\frac{1}{4}\left(T-T^2\right)p_i^2\,x_j^2+\frac{1}{4}\left(-T+T^2\right)p_i\,p_j\,x_j^2\right]\right]$

$\Gamma\left[\frac{1}{\sqrt{T}},\ p_i\,x_i+(1-T)\,p_i\,x_j+T\,p_j\,x_j\right]$

$\mathbb{E}_{\{\}\to\{i,j\}}\left[\sqrt{T},\ (-1+T)\,p_i\,x_j+(1-T)\,p_j\,x_j,\ \epsilon\mathrm{Series}[0,\ 0]\right]$

In[∘]:= $\gamma 1 = \Gamma\left[\omega,\ \{x_i,\ x_j,\ x_r\}.\begin{pmatrix}\alpha & \beta & \theta\\ \gamma & \delta & \epsilon\\ \phi & \psi & \Xi\end{pmatrix}.\{p_i,\ p_j,\ p_r\}\right]\ //\ \mathbb{E}$

Out[∘]= $\mathbb{E}_{\{\}\to\{i,j,r\}}\left[\frac{1}{\omega},\ (1-\alpha)\,p_i\,x_i-\beta\,p_j\,x_i-\theta\,p_r\,x_i-\gamma\,p_i\,x_j+(1-\delta)\,p_j\,x_j-\epsilon\,p_r\,x_j-\phi\,p_i\,x_r-\psi\,p_j\,x_r+(1-\Xi)\,p_r\,x_r,\ \epsilon\mathrm{Series}[0,\ 0]\right]$

In[∘]:= $\gamma 1\ //\ m_{i,j\to k}\ //\ \Gamma$

Out[∘]= $\Gamma\left[-\omega+\beta\,\omega,\ \frac{(-\gamma+\beta\,\gamma-\alpha\,\delta)\,p_k\,x_k}{-1+\beta}+\frac{(-\epsilon+\beta\,\epsilon-\delta\,\theta)\,p_r\,x_k}{-1+\beta}+\frac{(-\phi+\beta\,\phi-\alpha\,\psi)\,p_k\,x_r}{-1+\beta}+\frac{(-\Xi+\beta\,\Xi-\theta\,\psi)\,p_r\,x_r}{-1+\beta}\right]$

In[∘]:= $\text{Simplify}\left[\left(\mathbb{E}@\Gamma\left[\omega, \{x_1, x_2, x_3\}.\begin{pmatrix}\alpha & \beta & \gamma\\ \delta & \epsilon & \eta\\ \lambda & \mu & \nu\end{pmatrix}.\{p_1, p_2, p_3\}\right] \mathbb{E}_{\{\}\to\{i,j\}}[1, 0, \epsilon\text{Series}[0, p_i\, x_i]] \mathbin{//} m_{1,i\to1} \mathbin{//} m_{1,2\to1} \mathbin{//} m_{1,j\to1} \mathbin{//} m_{1,3\to1}\right)[\![3, 2]\!] \mathbin{/.} (x \mid p)\_ \to 0\right]$

Out[∘]= $\dfrac{\beta + \gamma\,\epsilon - \beta\,\eta}{-1 + \beta + \gamma\,\epsilon + \eta - \beta\,\eta}$

In[∘]:= $\text{Simplify}\left[\left(\mathbb{E}@\Gamma\left[\omega, \{x_1, x_2, x_3\}.\begin{pmatrix}\alpha & \beta & \gamma\\ \delta & \epsilon & \eta\\ \lambda & \mu & \nu\end{pmatrix}.\{p_1, p_2, p_3\}\right] \mathbb{E}_{\{\}\to\{i,j\}}\left[1, 0, \epsilon\text{Series}\left[0, p_i\, x_j\right]\right] \mathbin{//} m_{1,i\to1} \mathbin{//} m_{1,2\to1} \mathbin{//} m_{1,j\to1} \mathbin{//} m_{1,3\to1}\right)[\![3, 2]\!] \mathbin{/.} (x \mid p)\_ \to 0\right]$

Out[∘]= $\dfrac{\gamma}{-1 + \beta + \gamma\,\epsilon + \eta - \beta\,\eta}$

In[∘]:= $\text{Simplify}\left[\left(\mathbb{E}@\Gamma\left[\omega, \{x_1, x_2, x_3\}.\begin{pmatrix}\alpha & \beta & \gamma\\ \delta & \epsilon & \eta\\ \lambda & \mu & \nu\end{pmatrix}.\{p_1, p_2, p_3\}\right] \mathbb{E}_{\{\}\to\{i,j\}}\left[1, 0, \epsilon\text{Series}\left[0, p_j\, x_i\right]\right] \mathbin{//} m_{1,i\to1} \mathbin{//} m_{1,2\to1} \mathbin{//} m_{1,j\to1} \mathbin{//} m_{1,3\to1}\right)[\![3, 2]\!] \mathbin{/.} (x \mid p)\_ \to 0\right]$

Out[∘]= $\dfrac{\epsilon}{-1 + \beta + \gamma\,\epsilon + \eta - \beta\,\eta}$

In[∘]:= $\text{Simplify}\left[\left(\mathbb{E}@\Gamma\left[\omega, \{x_1, x_2, x_3\}.\begin{pmatrix}\alpha & \beta & \gamma\\ \delta & \epsilon & \eta\\ \lambda & \mu & \nu\end{pmatrix}.\{p_1, p_2, p_3\}\right] \mathbb{E}_{\{\}\to\{i,j\}}\left[1, 0, \epsilon\text{Series}\left[0, p_j\, x_j\right]\right] \mathbin{//} m_{1,i\to1} \mathbin{//} m_{1,2\to1} \mathbin{//} m_{1,j\to1} \mathbin{//} m_{1,3\to1}\right)[\![3, 2]\!] \mathbin{/.} (x \mid p)\_ \to 0\right]$

Out[∘]= $\dfrac{\gamma\,\epsilon + \eta - \beta\,\eta}{-1 + \beta + \gamma\,\epsilon + \eta - \beta\,\eta}$

In[∘]:= C_i

Out[∘]= $\mathbb{E}_{\{\}\to\{i\}}\left[\sqrt{T}, 0, \epsilon\text{Series}\left[0, \dfrac{p_i\, x_i}{2}\right]\right]$

In[∘]:= $\mathbf{CF}\left[\overline{\mathbf{Rp}}_{i,j} \text{ /. } T \to T^{-1}\right]$

Out[∘]= $\mathbb{E}_{\{\}\to\{i,j\}}\left[1, 0, \epsilon\text{Series}\left[0, -\frac{1}{2} p_i^2 x_i x_j + \frac{1}{2} p_i p_j x_i x_j + \frac{(1-T) p_i^2 x_j^2}{4T} + \frac{(-1+T) p_i p_j x_j^2}{4T}\right]\right]$

In[∘]:= $\mathbf{CF}\left[\mathbf{Rp}_{i,j}\right]$

Out[∘]= $\mathbb{E}_{\{\}\to\{i,j\}}\left[1, 0, \epsilon\text{Series}\left[0, \frac{1}{2} p_i^2 x_i x_j - \frac{1}{2} p_i p_j x_i x_j + \frac{(-1+T) p_i^2 x_j^2}{4T} + \frac{(1-T) p_i p_j x_j^2}{4T}\right]\right]$

In[∘]:= $\mathbf{Simplify}\left[\frac{1}{2} p_i^2 x_i x_j - \frac{1}{2} p_i p_j x_i x_j + \frac{(-1+T) p_i^2 x_j^2}{4T} + \frac{(1-T) p_i p_j x_j^2}{4T}\right]$

Out[∘]= $\frac{p_i \left(p_i - p_j\right) x_j \left(2 T x_i + (-1+T) x_j\right)}{4T}$

In[∘]:= $\mathbf{Simplify}\Big[\Big(\mathbb{E}@\Gamma\left[\omega, \{x_1, x_2, x_3\}.\begin{pmatrix}\alpha & \beta & \gamma\\ \delta & \epsilon & \eta\\ \lambda & \mu & \nu\end{pmatrix}.\{p_1, p_2, p_3\}\right] \mathbb{E}_{\{\}\to\{i,j\}}\left[1, 0, \epsilon\text{Series}\left[0, p_i^2 x_i x_j\right]\right] \text{ // } m_{1,i\to 1} \text{ // } m_{1,2\to 1} \text{ // } m_{1,j\to 1} \text{ // } m_{1,3\to 1}\Big)[[3, 2]] \text{ /. } (x\,|\,p)\_ \to 0\Big]$

Out[∘]= $\frac{2\gamma(\beta + \gamma\epsilon - \beta\eta)}{(-1+\beta+\gamma\epsilon+\eta-\beta\eta)^2}$

In[∘]:= $\mathbf{Simplify}\Big[\Big(\mathbb{E}@\Gamma\left[\omega, \{x_1, x_2, x_3\}.\begin{pmatrix}\alpha & \beta & \gamma\\ \delta & \epsilon & \eta\\ \lambda & \mu & \nu\end{pmatrix}.\{p_1, p_2, p_3\}\right] \mathbb{E}_{\{\}\to\{i,j\}}\left[1, 0, \epsilon\text{Series}\left[0, p_j x_j\right]\right] \text{ // } m_{1,i\to 1} \text{ // } m_{1,2\to 1} \text{ // } m_{1,j\to 1} \text{ // } m_{1,3\to 1}\Big)[[3, 2]] \text{ /. } (x\,|\,p)\_ \to 0\Big]$

Out[∘]= $\frac{\gamma\epsilon + \eta - \beta\eta}{-1+\beta+\gamma\epsilon+\eta-\beta\eta}$

In[∘]:= $\mathbb{E}@\Gamma\left[\omega, \{x_1, x_2, x_3\}.\begin{pmatrix}\alpha & \beta & \gamma\\ \delta & \epsilon & \eta\\ \lambda & \mu & \nu\end{pmatrix}.\{p_1, p_2, p_3\}\right] \mathbf{Rp}_{i,j} \text{ // } m_{1,i\to 1} \text{ // } m_{1,2\to 1} \text{ // } m_{1,j\to 1} \text{ // } m_{1,3\to 1}$

Out[∘]= $\mathbb{E}_{\{\}\to\{1\}}\Big[\frac{1}{\omega - \beta\omega - \gamma\epsilon\omega - \eta\omega + \beta\eta\omega},$
$\frac{(1-\beta-\gamma\epsilon-\eta+\beta\eta-\lambda+\beta\lambda+\gamma\epsilon\lambda+\eta\lambda-\beta\eta\lambda-\alpha\mu-\gamma\delta\mu+\alpha\eta\mu-\delta\nu+\beta\delta\nu-\alpha\epsilon\nu)\, p_1 x_1}{1-\beta-\gamma\epsilon-\eta+\beta\eta},$
$\epsilon\text{Series}\Big[0, \left(2T\beta\gamma - \gamma^2 + T\gamma^2 - T\gamma\epsilon - T\beta\gamma\epsilon + \gamma^2\epsilon + T\gamma^2\epsilon - T\gamma^2\epsilon^2 - T\beta\eta + T\beta^2\eta + \gamma\eta - T\gamma\eta - \beta\gamma\eta - T\beta\gamma\eta - T\gamma\epsilon\eta + 2T\beta\gamma\epsilon\eta + T\beta\eta^2 - T\beta^2\eta^2\right) \Big/ \left(2T - 4T\beta + 2T\beta^2 - 4T\gamma\epsilon + 4T\beta\gamma\epsilon + 2T\gamma^2\epsilon^2 - 4T\eta + 8T\beta\eta - 4T\beta^2\eta + 4T\gamma\epsilon\eta - 4T\beta\gamma\epsilon\eta + 2T\eta^2 - 4T\beta\eta^2 + 2T\beta^2\eta^2\right) +$

$$\Big(\Big(-2\,T\,\alpha\,\gamma\,\mu-2\,T\,\alpha\,\beta\,\gamma\,\mu+2\,\alpha\,\gamma^2\,\mu-2\,T\,\alpha\,\gamma^2\,\mu+T\,\gamma\,\delta\,\mu-T\,\beta^2\,\gamma\,\delta\,\mu-\gamma^2\,\delta\,\mu-T\,\gamma^2\,\delta\,\mu+$$
$$\beta\,\gamma^2\,\delta\,\mu-3\,T\,\beta\,\gamma^2\,\delta\,\mu+2\,\gamma^3\,\delta\,\mu-2\,T\,\gamma^3\,\delta\,\mu+3\,T\,\alpha\,\gamma\in\mu+T\,\alpha\,\beta\,\gamma\in\mu-2\,\alpha\,\gamma^2\in\mu+$$
$$3\,T\,\gamma^2\,\delta\in\mu-T\,\beta\,\gamma^2\,\delta\in\mu-\gamma^3\,\delta\in\mu-T\,\gamma^3\,\delta\in\mu+T\,\alpha\,\gamma^2\in^2\mu+T\,\alpha\,\eta\,\mu-T\,\alpha\,\beta\,\eta\,\mu-\alpha\,\gamma\,\eta\,\mu+$$
$$5\,T\,\alpha\,\gamma\,\eta\,\mu+\alpha\,\beta\,\gamma\,\eta\,\mu+3\,T\,\alpha\,\beta\,\gamma\,\eta\,\mu-2\,\alpha\,\gamma^2\,\eta\,\mu+2\,T\,\alpha\,\gamma^2\,\eta\,\mu-T\,\beta\,\gamma\,\delta\,\eta\,\mu+T\,\beta^2\,\gamma\,\delta\,\eta\,\mu-$$
$$\gamma^2\,\delta\,\eta\,\mu+3\,T\,\gamma^2\,\delta\,\eta\,\mu+\beta\,\gamma^2\,\delta\,\eta\,\mu+T\,\beta\,\gamma^2\,\delta\,\eta\,\mu-4\,T\,\alpha\,\gamma\in\eta\,\mu-T\,\alpha\,\beta\,\gamma\in\eta\,\mu+\alpha\,\gamma^2\in\eta\,\mu+$$
$$T\,\alpha\,\gamma^2\in\eta\,\mu-T\,\gamma^2\,\delta\in\eta\,\mu-2\,T\,\alpha\,\eta^2\,\mu+2\,T\,\alpha\,\beta\,\eta^2\,\mu+\alpha\,\gamma\,\eta^2\,\mu-3\,T\,\alpha\,\gamma\,\eta^2\,\mu-\alpha\,\beta\,\gamma\,\eta^2\,\mu-$$
$$T\,\alpha\,\beta\,\gamma\,\eta^2\,\mu-T\,\gamma\,\delta\,\eta^2\,\mu+T\,\beta\,\gamma\,\delta\,\eta^2\,\mu+T\,\alpha\,\gamma\in\eta^2\,\mu+T\,\alpha\,\eta^3\,\mu-T\,\alpha\,\beta\,\eta^3\,\mu-2\,T\,\alpha\,\beta\,\nu+$$
$$2\,T\,\alpha\,\beta^2\,\nu+2\,\alpha\,\gamma\,\nu-2\,T\,\alpha\,\gamma\,\nu-2\,\alpha\,\beta\,\gamma\,\nu+2\,T\,\alpha\,\beta\,\gamma\,\nu+T\,\beta\,\delta\,\nu-2\,T\,\beta^2\,\delta\,\nu+T\,\beta^3\,\delta\,\nu-\gamma\,\delta\,\nu+$$
$$T\,\gamma\,\delta\,\nu+2\,\beta\,\gamma\,\delta\,\nu-4\,T\,\beta\,\gamma\,\delta\,\nu-\beta^2\,\gamma\,\delta\,\nu+3\,T\,\beta^2\,\gamma\,\delta\,\nu+2\,\gamma^2\,\delta\,\nu-2\,T\,\gamma^2\,\delta\,\nu-2\,\beta\,\gamma^2\,\delta\,\nu+$$
$$2\,T\,\beta\,\gamma^2\,\delta\,\nu+T\,\alpha\in\nu-T\,\alpha\,\beta^2\in\nu-2\,\alpha\,\gamma\in\nu-2\,T\,\alpha\,\gamma\in\nu+2\,\alpha\,\beta\,\gamma\in\nu+3\,T\,\gamma\,\delta\in\nu-$$
$$4\,T\,\beta\,\gamma\,\delta\in\nu+T\,\beta^2\,\gamma\,\delta\in\nu-\gamma^2\,\delta\in\nu-3\,T\,\gamma^2\,\delta\in\nu+\beta\,\gamma^2\,\delta\in\nu+T\,\beta\,\gamma^2\,\delta\in\nu+3\,T\,\alpha\,\gamma\in^2\nu-$$
$$T\,\alpha\,\beta\,\gamma\in^2\nu+T\,\gamma^2\,\delta\in^2\nu-\alpha\,\eta\,\nu+T\,\alpha\,\eta\,\nu+2\,\alpha\,\beta\,\eta\,\nu+2\,T\,\alpha\,\beta\,\eta\,\nu-\alpha\,\beta^2\,\eta\,\nu-3\,T\,\alpha\,\beta^2\,\eta\,\nu-$$
$$2\,\alpha\,\gamma\,\eta\,\nu+2\,T\,\alpha\,\gamma\,\eta\,\nu+2\,\alpha\,\beta\,\gamma\,\eta\,\nu-2\,T\,\alpha\,\beta\,\gamma\,\eta\,\nu-T\,\beta\,\delta\,\eta\,\nu+2\,T\,\beta^2\,\delta\,\eta\,\nu-T\,\beta^3\,\delta\,\eta\,\nu-$$
$$\gamma\,\delta\,\eta\,\nu+T\,\gamma\,\delta\,\eta\,\nu+2\,\beta\,\gamma\,\delta\,\eta\,\nu-\beta^2\,\gamma\,\delta\,\eta\,\nu-T\,\beta^2\,\gamma\,\delta\,\eta\,\nu-T\,\alpha\,\beta\in\eta\,\nu+T\,\alpha\,\beta^2\in\eta\,\nu+$$
$$\alpha\,\gamma\in\eta\,\nu+3\,T\,\alpha\,\gamma\in\eta\,\nu-\alpha\,\beta\,\gamma\in\eta\,\nu-T\,\alpha\,\beta\,\gamma\in\eta\,\nu+T\,\gamma\,\delta\in\eta\,\nu-T\,\beta\,\gamma\,\delta\in\eta\,\nu-T\,\alpha\,\gamma\in^2\eta\,\nu+$$
$$\alpha\,\eta^2\,\nu-T\,\alpha\,\eta^2\,\nu-2\,\alpha\,\beta\,\eta^2\,\nu+\alpha\,\beta^2\,\eta^2\,\nu+T\,\alpha\,\beta^2\,\eta^2\,\nu-T\,\alpha\in\eta^2\,\nu+T\,\alpha\,\beta\in\eta^2\,\nu\Big)\,p_1\,x_1\Big)\Big/$$
$$\Big(2\,T-6\,T\,\beta+6\,T\,\beta^2-2\,T\,\beta^3-6\,T\,\gamma\in+12\,T\,\beta\,\gamma\in-6\,T\,\beta^2\,\gamma\in+6\,T\,\gamma^2\in^2-6\,T\,\beta\,\gamma^2\in^2-$$
$$2\,T\,\gamma^3\in^3-6\,T\,\eta+18\,T\,\beta\,\eta-18\,T\,\beta^2\,\eta+6\,T\,\beta^3\,\eta+12\,T\,\gamma\in\eta-24\,T\,\beta\,\gamma\in\eta+$$
$$12\,T\,\beta^2\,\gamma\in\eta-6\,T\,\gamma^2\in^2\eta+6\,T\,\beta\,\gamma^2\in^2\eta+6\,T\,\eta^2-18\,T\,\beta\,\eta^2+18\,T\,\beta^2\,\eta^2-6\,T\,\beta^3\,\eta^2-$$
$$6\,T\,\gamma\in\eta^2+12\,T\,\beta\,\gamma\in\eta^2-6\,T\,\beta^2\,\gamma\in\eta^2-2\,T\,\eta^3+6\,T\,\beta\,\eta^3-6\,T\,\beta^2\,\eta^3+2\,T\,\beta^3\,\eta^3\Big)+$$
$$\Big(\Big(2\,T\,\alpha^2\,\gamma\,\mu^2-\alpha^2\,\gamma^2\,\mu^2+T\,\alpha^2\,\gamma^2\,\mu^2-2\,T\,\alpha\,\gamma\,\delta\,\mu^2+2\,T\,\alpha\,\beta\,\gamma\,\delta\,\mu^2+\alpha\,\gamma^2\,\delta\,\mu^2+3\,T\,\alpha\,\gamma^2\,\delta\,\mu^2-\alpha\,\beta\,\gamma^2\,\delta\,\mu^2+$$
$$T\,\alpha\,\beta\,\gamma^2\,\delta\,\mu^2-2\,\alpha\,\gamma^3\,\delta\,\mu^2+2\,T\,\alpha\,\gamma^3\,\delta\,\mu^2-2\,T\,\gamma^2\,\delta^2\,\mu^2+2\,T\,\beta\,\gamma^2\,\delta^2\,\mu^2+\gamma^3\,\delta^2\,\mu^2+T\,\gamma^3\,\delta^2\,\mu^2-$$
$$\beta\,\gamma^3\,\delta^2\,\mu^2+T\,\beta\,\gamma^3\,\delta^2\,\mu^2-\gamma^4\,\delta^2\,\mu^2+T\,\gamma^4\,\delta^2\,\mu^2-2\,T\,\alpha^2\,\gamma\in\mu^2+\alpha^2\,\gamma^2\in\mu^2-T\,\alpha^2\,\gamma^2\in\mu^2-$$
$$2\,T\,\alpha\,\gamma^2\,\delta\in\mu^2+\alpha\,\gamma^3\,\delta\in\mu^2-T\,\alpha\,\gamma^3\,\delta\in\mu^2-6\,T\,\alpha^2\,\gamma\,\eta\,\mu^2+2\,\alpha^2\,\gamma^2\,\eta\,\mu^2-2\,T\,\alpha^2\,\gamma^2\,\eta\,\mu^2+$$
$$4\,T\,\alpha\,\gamma\,\delta\,\eta\,\mu^2-4\,T\,\alpha\,\beta\,\gamma\,\delta\,\eta\,\mu^2-\alpha\,\gamma^2\,\delta\,\eta\,\mu^2-7\,T\,\alpha\,\gamma^2\,\delta\,\eta\,\mu^2+\alpha\,\beta\,\gamma^2\,\delta\,\eta\,\mu^2-T\,\alpha\,\beta\,\gamma^2\,\delta\,\eta\,\mu^2+$$
$$2\,\alpha\,\gamma^3\,\delta\,\eta\,\mu^2-2\,T\,\alpha\,\gamma^3\,\delta\,\eta\,\mu^2+2\,T\,\gamma^2\,\delta^2\,\eta\,\mu^2-2\,T\,\beta\,\gamma^2\,\delta^2\,\eta\,\mu^2-2\,T\,\gamma^3\,\delta^2\,\eta\,\mu^2+4\,T\,\alpha^2\,\gamma\in\eta\,\mu^2-$$
$$\alpha^2\,\gamma^2\in\eta\,\mu^2+T\,\alpha^2\,\gamma^2\in\eta\,\mu^2+2\,T\,\alpha\,\gamma^2\,\delta\in\eta\,\mu^2+6\,T\,\alpha^2\,\gamma\,\eta^2\,\mu^2-\alpha^2\,\gamma^2\,\eta^2\,\mu^2+T\,\alpha^2\,\gamma^2\,\eta^2\,\mu^2-$$
$$2\,T\,\alpha\,\gamma\,\delta\,\eta^2\,\mu^2+2\,T\,\alpha\,\beta\,\gamma\,\delta\,\eta^2\,\mu^2+4\,T\,\alpha\,\gamma^2\,\delta\,\eta^2\,\mu^2-2\,T\,\alpha^2\,\gamma\in\eta^2\,\mu^2-2\,T\,\alpha^2\,\gamma\,\eta^3\,\mu^2+2\,T\,\alpha^2\,\mu\,\nu-$$
$$2\,T\,\alpha^2\,\beta\,\mu\,\nu-2\,\alpha^2\,\gamma\,\mu\,\nu+2\,T\,\alpha^2\,\gamma\,\mu\,\nu+2\,\alpha^2\,\beta\,\gamma\,\mu\,\nu-2\,T\,\alpha^2\,\beta\,\gamma\,\mu\,\nu-2\,T\,\alpha\,\delta\,\mu\,\nu+4\,T\,\alpha\,\beta\,\delta\,\mu\,\nu-$$
$$2\,T\,\alpha\,\beta^2\,\delta\,\mu\,\nu+2\,\alpha\,\gamma\,\delta\,\mu\,\nu+2\,T\,\alpha\,\gamma\,\delta\,\mu\,\nu-4\,\alpha\,\beta\,\gamma\,\delta\,\mu\,\nu+2\,\alpha\,\beta^2\,\gamma\,\delta\,\mu\,\nu-2\,T\,\alpha\,\beta^2\,\gamma\,\delta\,\mu\,\nu-$$
$$4\,\alpha\,\gamma^2\,\delta\,\mu\,\nu+4\,T\,\alpha\,\gamma^2\,\delta\,\mu\,\nu+4\,\alpha\,\beta\,\gamma^2\,\delta\,\mu\,\nu-4\,T\,\alpha\,\beta\,\gamma^2\,\delta\,\mu\,\nu-2\,T\,\gamma\,\delta^2\,\mu\,\nu+4\,T\,\beta\,\gamma\,\delta^2\,\mu\,\nu-$$
$$2\,T\,\beta^2\,\gamma\,\delta^2\,\mu\,\nu+2\,\gamma^2\,\delta^2\,\mu\,\nu-4\,\beta\,\gamma^2\,\delta^2\,\mu\,\nu+2\,T\,\beta\,\gamma^2\,\delta^2\,\mu\,\nu+2\,\beta^2\,\gamma^2\,\delta^2\,\mu\,\nu-2\,T\,\beta^2\,\gamma^2\,\delta^2\,\mu\,\nu-$$
$$2\,\gamma^3\,\delta^2\,\mu\,\nu+2\,T\,\gamma^3\,\delta^2\,\mu\,\nu+2\,\beta\,\gamma^3\,\delta^2\,\mu\,\nu-2\,T\,\beta\,\gamma^3\,\delta^2\,\mu\,\nu-2\,T\,\alpha^2\in\mu\,\nu+2\,T\,\alpha^2\,\beta\in\mu\,\nu+$$
$$2\,\alpha^2\,\gamma\in\mu\,\nu-2\,\alpha^2\,\beta\,\gamma\in\mu\,\nu+2\,T\,\alpha^2\,\beta\,\gamma\in\mu\,\nu-4\,T\,\alpha\,\gamma\,\delta\in\mu\,\nu+4\,T\,\alpha\,\beta\,\gamma\,\delta\in\mu\,\nu+2\,\alpha\,\gamma^2\,\delta\in\mu\,\nu+$$
$$2\,T\,\alpha\,\gamma^2\,\delta\in\mu\,\nu-2\,\alpha\,\beta\,\gamma^2\,\delta\in\mu\,\nu+2\,T\,\alpha\,\beta\,\gamma^2\,\delta\in\mu\,\nu-2\,T\,\gamma^2\,\delta^2\in\mu\,\nu+2\,T\,\beta\,\gamma^2\,\delta^2\in\mu\,\nu+$$
$$2\,T\,\gamma^3\,\delta^2\in\mu\,\nu-2\,T\,\alpha^2\,\gamma\in^2\mu\,\nu-2\,T\,\alpha\,\gamma^2\,\delta\in^2\mu\,\nu-6\,T\,\alpha^2\,\eta\,\mu\,\nu+6\,T\,\alpha^2\,\beta\,\eta\,\mu\,\nu+4\,\alpha^2\,\gamma\,\eta\,\mu\,\nu-$$
$$4\,T\,\alpha^2\,\gamma\,\eta\,\mu\,\nu-4\,\alpha^2\,\beta\,\gamma\,\eta\,\mu\,\nu+4\,T\,\alpha^2\,\beta\,\gamma\,\eta\,\mu\,\nu+4\,T\,\alpha\,\delta\,\eta\,\mu\,\nu-8\,T\,\alpha\,\beta\,\delta\,\eta\,\mu\,\nu+4\,T\,\alpha\,\beta^2\,\delta\,\eta\,\mu\,\nu-$$
$$2\,\alpha\,\gamma\,\delta\,\eta\,\mu\,\nu-6\,T\,\alpha\,\gamma\,\delta\,\eta\,\mu\,\nu+4\,\alpha\,\beta\,\gamma\,\delta\,\eta\,\mu\,\nu+4\,T\,\alpha\,\beta\,\gamma\,\delta\,\eta\,\mu\,\nu-2\,\alpha\,\beta^2\,\gamma\,\delta\,\eta\,\mu\,\nu+$$
$$2\,T\,\alpha\,\beta^2\,\gamma\,\delta\,\eta\,\mu\,\nu+4\,\alpha\,\gamma^2\,\delta\,\eta\,\mu\,\nu-4\,T\,\alpha\,\gamma^2\,\delta\,\eta\,\mu\,\nu-4\,\alpha\,\beta\,\gamma^2\,\delta\,\eta\,\mu\,\nu+4\,T\,\alpha\,\beta\,\gamma^2\,\delta\,\eta\,\mu\,\nu+$$
$$2\,T\,\gamma\,\delta^2\,\eta\,\mu\,\nu-4\,T\,\beta\,\gamma\,\delta^2\,\eta\,\mu\,\nu+2\,T\,\beta^2\,\gamma\,\delta^2\,\eta\,\mu\,\nu-2\,T\,\gamma^2\,\delta^2\,\eta\,\mu\,\nu+2\,T\,\beta\,\gamma^2\,\delta^2\,\eta\,\mu\,\nu+$$
$$4\,T\,\alpha^2\in\eta\,\mu\,\nu-4\,T\,\alpha^2\,\beta\in\eta\,\mu\,\nu-2\,\alpha^2\,\gamma\in\eta\,\mu\,\nu-2\,T\,\alpha^2\,\gamma\in\eta\,\mu\,\nu+2\,\alpha^2\,\beta\,\gamma\in\eta\,\mu\,\nu-$$
$$2\,T\,\alpha^2\,\beta\,\gamma\in\eta\,\mu\,\nu+4\,T\,\alpha\,\gamma\,\delta\in\eta\,\mu\,\nu-4\,T\,\alpha\,\beta\,\gamma\,\delta\in\eta\,\mu\,\nu-4\,T\,\alpha\,\gamma^2\,\delta\in\eta\,\mu\,\nu+2\,T\,\alpha^2\,\gamma\in^2\eta\,\mu\,\nu+$$
$$6\,T\,\alpha^2\,\eta^2\,\mu\,\nu-6\,T\,\alpha^2\,\beta\,\eta^2\,\mu\,\nu-2\,\alpha^2\,\gamma\,\eta^2\,\mu\,\nu+2\,T\,\alpha^2\,\gamma\,\eta^2\,\mu\,\nu+2\,\alpha^2\,\beta\,\gamma\,\eta^2\,\mu\,\nu-2\,T\,\alpha^2\,\beta\,\gamma\,\eta^2\,\mu\,\nu-$$
$$2\,T\,\alpha\,\delta\,\eta^2\,\mu\,\nu+4\,T\,\alpha\,\beta\,\delta\,\eta^2\,\mu\,\nu-2\,T\,\alpha\,\beta^2\,\delta\,\eta^2\,\mu\,\nu+4\,T\,\alpha\,\gamma\,\delta\,\eta^2\,\mu\,\nu-4\,T\,\alpha\,\beta\,\gamma\,\delta\,\eta^2\,\mu\,\nu-$$

$$2 T \alpha^2 \epsilon \eta^2 \mu \nu + 2 T \alpha^2 \beta \epsilon \eta^2 \mu \nu + 2 T \alpha^2 \gamma \epsilon \eta^2 \mu \nu - 2 T \alpha^2 \eta^3 \mu \nu + 2 T \alpha^2 \beta \eta^3 \mu \nu - \alpha^2 \nu^2 +$$
$$T \alpha^2 \nu^2 + 2 \alpha^2 \beta \nu^2 - 2 T \alpha^2 \beta \nu^2 - \alpha^2 \beta^2 \nu^2 + T \alpha^2 \beta^2 \nu^2 + \alpha \delta \nu^2 - T \alpha \delta \nu^2 - 3 \alpha \beta \delta \nu^2 +$$
$$3 T \alpha \beta \delta \nu^2 + 3 \alpha \beta^2 \delta \nu^2 - 3 T \alpha \beta^2 \delta \nu^2 - \alpha \beta^3 \delta \nu^2 + T \alpha \beta^3 \delta \nu^2 - 2 \alpha \gamma \delta \nu^2 + 2 T \alpha \gamma \delta \nu^2 +$$
$$4 \alpha \beta \gamma \delta \nu^2 - 4 T \alpha \beta \gamma \delta \nu^2 - 2 \alpha \beta^2 \gamma \delta \nu^2 + 2 T \alpha \beta^2 \gamma \delta \nu^2 + \gamma \delta^2 \nu^2 - T \gamma \delta^2 \nu^2 - 3 \beta \gamma \delta^2 \nu^2 +$$
$$3 T \beta \gamma \delta^2 \nu^2 + 3 \beta^2 \gamma \delta^2 \nu^2 - 3 T \beta^2 \gamma \delta^2 \nu^2 - \beta^3 \gamma \delta^2 \nu^2 + T \beta^3 \gamma \delta^2 \nu^2 - \gamma^2 \delta^2 \nu^2 + T \gamma^2 \delta^2 \nu^2 +$$
$$2 \beta \gamma^2 \delta^2 \nu^2 - 2 T \beta \gamma^2 \delta^2 \nu^2 - \beta^2 \gamma^2 \delta^2 \nu^2 + T \beta^2 \gamma^2 \delta^2 \nu^2 + \alpha^2 \epsilon \nu^2 + T \alpha^2 \epsilon \nu^2 - 2 \alpha^2 \beta \epsilon \nu^2 +$$
$$\alpha^2 \beta^2 \epsilon \nu^2 - T \alpha^2 \beta^2 \epsilon \nu^2 - 2 T \alpha \delta \epsilon \nu^2 + 4 T \alpha \beta \delta \epsilon \nu^2 - 2 T \alpha \beta^2 \delta \epsilon \nu^2 + \alpha \gamma \delta \epsilon \nu^2 +$$
$$3 T \alpha \gamma \delta \epsilon \nu^2 - 2 \alpha \beta \gamma \delta \epsilon \nu^2 - 2 T \alpha \beta \gamma \delta \epsilon \nu^2 + \alpha \beta^2 \gamma \delta \epsilon \nu^2 - T \alpha \beta^2 \gamma \delta \epsilon \nu^2 - 2 T \gamma \delta^2 \epsilon \nu^2 +$$
$$4 T \beta \gamma \delta^2 \epsilon \nu^2 - 2 T \beta^2 \gamma \delta^2 \epsilon \nu^2 + 2 T \gamma^2 \delta^2 \epsilon \nu^2 - 2 T \beta \gamma^2 \delta^2 \epsilon \nu^2 - 2 T \alpha^2 \epsilon^2 \nu^2 + 2 T \alpha^2 \beta \epsilon^2 \nu^2 -$$
$$2 T \alpha \gamma \delta \epsilon^2 \nu^2 + 2 T \alpha \beta \gamma \delta \epsilon^2 \nu^2 + 2 \alpha^2 \eta \nu^2 - 2 T \alpha^2 \eta \nu^2 - 4 \alpha^2 \beta \eta \nu^2 + 4 T \alpha^2 \beta \eta \nu^2 +$$
$$2 \alpha^2 \beta^2 \eta \nu^2 - 2 T \alpha^2 \beta^2 \eta \nu^2 - \alpha \delta \eta \nu^2 + T \alpha \delta \eta \nu^2 + 3 \alpha \beta \delta \eta \nu^2 - 3 T \alpha \beta \delta \eta \nu^2 - 3 \alpha \beta^2 \delta \eta \nu^2 +$$
$$3 T \alpha \beta^2 \delta \eta \nu^2 + \alpha \beta^3 \delta \eta \nu^2 - T \alpha \beta^3 \delta \eta \nu^2 + 2 \alpha \gamma \delta \eta \nu^2 - 2 T \alpha \gamma \delta \eta \nu^2 - 4 \alpha \beta \gamma \delta \eta \nu^2 +$$
$$4 T \alpha \beta \gamma \delta \eta \nu^2 + 2 \alpha \beta^2 \gamma \delta \eta \nu^2 - 2 T \alpha \beta^2 \gamma \delta \eta \nu^2 - \alpha^2 \epsilon \eta \nu^2 - 3 T \alpha^2 \epsilon \eta \nu^2 + 2 \alpha^2 \beta \epsilon \eta \nu^2 +$$
$$2 T \alpha^2 \beta \epsilon \eta \nu^2 - \alpha^2 \beta^2 \epsilon \eta \nu^2 + T \alpha^2 \beta^2 \epsilon \eta \nu^2 + 2 T \alpha \delta \epsilon \eta \nu^2 - 4 T \alpha \beta \delta \epsilon \eta \nu^2 + 2 T \alpha \beta^2 \delta \epsilon \eta \nu^2 -$$
$$4 T \alpha \gamma \delta \epsilon \eta \nu^2 + 4 T \alpha \beta \gamma \delta \epsilon \eta \nu^2 + 2 T \alpha^2 \epsilon^2 \eta \nu^2 - 2 T \alpha^2 \beta \epsilon^2 \eta \nu^2 - \alpha^2 \eta^2 \nu^2 + T \alpha^2 \eta^2 \nu^2 +$$
$$2 \alpha^2 \beta \eta^2 \nu^2 - 2 T \alpha^2 \beta \eta^2 \nu^2 - \alpha^2 \beta^2 \eta^2 \nu^2 + T \alpha^2 \beta^2 \eta^2 \nu^2 + 2 T \alpha^2 \epsilon \eta^2 \nu^2 - 2 T \alpha^2 \beta \epsilon \eta^2 \nu^2 \big) p_1^2 x_1^2 \big) \Big/$$
$$\big(4 T - 16 T \beta + 24 T \beta^2 - 16 T \beta^3 + 4 T \beta^4 - 16 T \gamma \epsilon + 48 T \beta \gamma \epsilon - 48 T \beta^2 \gamma \epsilon + 16 T \beta^3 \gamma \epsilon +$$
$$24 T \gamma^2 \epsilon^2 - 48 T \beta \gamma^2 \epsilon^2 + 24 T \beta^2 \gamma^2 \epsilon^2 - 16 T \gamma^3 \epsilon^3 + 16 T \beta \gamma^3 \epsilon^3 + 4 T \gamma^4 \epsilon^4 -$$
$$16 T \eta + 64 T \beta \eta - 96 T \beta^2 \eta + 64 T \beta^3 \eta - 16 T \beta^4 \eta + 48 T \gamma \epsilon \eta - 144 T \beta \gamma \epsilon \eta +$$
$$144 T \beta^2 \gamma \epsilon \eta - 48 T \beta^3 \gamma \epsilon \eta - 48 T \gamma^2 \epsilon^2 \eta + 96 T \beta \gamma^2 \epsilon^2 \eta - 48 T \beta^2 \gamma^2 \epsilon^2 \eta +$$
$$16 T \gamma^3 \epsilon^3 \eta - 16 T \beta \gamma^3 \epsilon^3 \eta + 24 T \eta^2 - 96 T \beta \eta^2 + 144 T \beta^2 \eta^2 - 96 T \beta^3 \eta^2 +$$
$$24 T \beta^4 \eta^2 - 48 T \gamma \epsilon \eta^2 + 144 T \beta \gamma \epsilon \eta^2 - 144 T \beta^2 \gamma \epsilon \eta^2 + 48 T \beta^3 \gamma \epsilon \eta^2 +$$
$$24 T \gamma^2 \epsilon^2 \eta^2 - 48 T \beta \gamma^2 \epsilon^2 \eta^2 + 24 T \beta^2 \gamma^2 \epsilon^2 \eta^2 - 16 T \eta^3 + 64 T \beta \eta^3 -$$
$$96 T \beta^2 \eta^3 + 64 T \beta^3 \eta^3 - 16 T \beta^4 \eta^3 + 16 T \gamma \epsilon \eta^3 - 48 T \beta \gamma \epsilon \eta^3 + 48 T \beta^2 \gamma \epsilon \eta^3 -$$
$$16 T \beta^3 \gamma \epsilon \eta^3 + 4 T \eta^4 - 16 T \beta \eta^4 + 24 T \beta^2 \eta^4 - 16 T \beta^3 \eta^4 + 4 T \beta^4 \eta^4 \big) \big] \big]$$

In[∘]:=
```
Simplify[(β γ - T β γ - T γ^2 + T^2 γ^2 - γ ∈ - β γ ∈ + γ^2 ∈ + T γ^2 ∈ -
    γ^2 ∈^2 - β η + β^2 η + 2 T γ η - β γ η - T β γ η - γ ∈ η + 2 β γ ∈ η + β η^2 - β^2 η^2) /
  (2 - 4 β + 2 β^2 - 4 γ ∈ + 4 β γ ∈ + 2 γ^2 ∈^2 - 4 η + 8 β η - 4 β^2 η + 4 γ ∈ η - 4 β γ ∈ η + 2 η^2 - 4 β η^2 + 2 β^2 η^2)]
```

Out[∘]=
$$\frac{1}{2 (-1 + \beta + \gamma \epsilon + \eta - \beta \eta)^2} \big(\beta (-1 + \eta) \eta - \beta^2 (-1 + \eta) \eta -$$
$$\beta \gamma (-1 + T + \epsilon + \eta + T \eta - 2 \epsilon \eta) + \gamma \big(T^2 \gamma - \epsilon (1 + \gamma (-1 + \epsilon) + \eta) + T (\gamma (-1 + \epsilon) + 2 \eta)\big)\big)$$

In[∘]:=
```
(IdentityMatrix[3] - {{α, β, γ}, {δ, ∈, η}, {λ, μ, ν}}) // Det // Simplify
```

Out[∘]=
$$1 - \epsilon - \gamma \lambda + \gamma \epsilon \lambda - \gamma \delta \mu - \eta \mu - \nu + \epsilon \nu - \beta (\delta + \eta \lambda - \delta \nu) + \alpha (-1 + \epsilon + \eta \mu + \nu - \epsilon \nu)$$

Solving for *R*, *C*, $k = 2

In[∘]:=
```
$k = 2;
{R1,2, C1}
Short[RMoves, 20]
```

Out[∘]=
$$\Big\{\mathbb{E}_{\{\}\to\{1,2\}}\Big[\sqrt{T},\ (-1+T)\,p_1 x_2 + (1-T)\,p_2 x_2,$$
$$\in\text{Series}\Big[0,\ \frac{1}{2}\,T\,p_1^2 x_1 x_2 - \frac{1}{2}\,T\,p_1 p_2 x_1 x_2 + \frac{1}{4}\,(T-T^2)\,p_1^2 x_2^2 + \frac{1}{4}\,(-T+T^2)\,p_1 p_2 x_2^2,$$
$$c_{2,1} + p_1 x_1 c_{2,2} + p_1 x_2\,(c_{2,2} - T\,c_{2,2} + T\,c_{2,3}) + p_2 x_1 c_{2,4} + p_2 x_2\,(c_{2,4} - T\,c_{2,4} + T\,c_{2,5}) + p_1^2 x_1^2 c_{2,6} +$$
$$p_1^2 x_1 x_2\,(2\,c_{2,6} - 2\,T\,c_{2,6} + T\,c_{2,7}) + p_1^2 x_2^2\,(c_{2,6} - 2\,T\,c_{2,6} + T^2\,c_{2,6} + T\,c_{2,7} - T^2\,c_{2,7} + T^2\,c_{2,8}) +$$
$$p_1 p_2 x_1^2 c_{2,9} + p_1 p_2 x_1 x_2\,(2\,c_{2,9} - 2\,T\,c_{2,9} + T\,c_{2,10}) +$$
$$p_1 p_2 x_2^2\,(c_{2,9} - 2\,T\,c_{2,9} + T^2\,c_{2,9} + T\,c_{2,10} - T^2\,c_{2,10} + T^2\,c_{2,11}) + p_2^2 x_1^2 c_{2,12} +$$
$$p_2^2 x_1 x_2\,(2\,c_{2,12} - 2\,T\,c_{2,12} + T\,c_{2,13}) + p_2^2 x_2^2\,(c_{2,12} - 2\,T\,c_{2,12} + T^2\,c_{2,12} + T\,c_{2,13} - T^2\,c_{2,13} + T^2\,c_{2,14}) +$$
$$p_1^3 x_1^3 c_{2,15} + p_1^3 x_1^2 x_2\,(3\,c_{2,15} - 3\,T\,c_{2,15} + T\,c_{2,16}) +$$
$$p_1^3 x_1 x_2^2\,(3\,c_{2,15} - 6\,T\,c_{2,15} + 3\,T^2\,c_{2,15} + 2\,T\,c_{2,16} - 2\,T^2\,c_{2,16} + T^2\,c_{2,17}) + p_1^3 x_2^3$$
$$(c_{2,15} - 3\,T\,c_{2,15} + 3\,T^2\,c_{2,15} - T^3\,c_{2,15} + T\,c_{2,16} - 2\,T^2\,c_{2,16} + T^3\,c_{2,16} + T^2\,c_{2,17} - T^3\,c_{2,17} + T^3\,c_{2,18}) +$$
$$p_1^2 p_2 x_1^3 c_{2,19} + p_1^2 p_2 x_1^2 x_2\,(3\,c_{2,19} - 3\,T\,c_{2,19} + T\,c_{2,20}) +$$
$$p_1^2 p_2 x_1 x_2^2\,(3\,c_{2,19} - 6\,T\,c_{2,19} + 3\,T^2\,c_{2,19} + 2\,T\,c_{2,20} - 2\,T^2\,c_{2,20} + T^2\,c_{2,21}) + p_1^2 p_2 x_2^3$$
$$(c_{2,19} - 3\,T\,c_{2,19} + 3\,T^2\,c_{2,19} - T^3\,c_{2,19} + T\,c_{2,20} - 2\,T^2\,c_{2,20} + T^3\,c_{2,20} + T^2\,c_{2,21} - T^3\,c_{2,21} + T^3\,c_{2,22}) +$$
$$p_1 p_2^2 x_1^3 c_{2,23} + p_1 p_2^2 x_1^2 x_2\,(3\,c_{2,23} - 3\,T\,c_{2,23} + T\,c_{2,24}) +$$
$$p_1 p_2^2 x_1 x_2^2\,(3\,c_{2,23} - 6\,T\,c_{2,23} + 3\,T^2\,c_{2,23} + 2\,T\,c_{2,24} - 2\,T^2\,c_{2,24} + T^2\,c_{2,25}) + p_1 p_2^2 x_2^3$$
$$(c_{2,23} - 3\,T\,c_{2,23} + 3\,T^2\,c_{2,23} - T^3\,c_{2,23} + T\,c_{2,24} - 2\,T^2\,c_{2,24} + T^3\,c_{2,24} + T^2\,c_{2,25} - T^3\,c_{2,25} + T^3\,c_{2,26}) +$$
$$p_2^3 x_1^3 c_{2,27} + p_2^3 x_1^2 x_2\,(3\,c_{2,27} - 3\,T\,c_{2,27} + T\,c_{2,28}) +$$
$$p_2^3 x_1 x_2^2\,(3\,c_{2,27} - 6\,T\,c_{2,27} + 3\,T^2\,c_{2,27} + 2\,T\,c_{2,28} - 2\,T^2\,c_{2,28} + T^2\,c_{2,29}) + p_2^3 x_2^3$$
$$(c_{2,27} - 3\,T\,c_{2,27} + 3\,T^2\,c_{2,27} - T^3\,c_{2,27} + T\,c_{2,28} - 2\,T^2\,c_{2,28} + T^3\,c_{2,28} + T^2\,c_{2,29} - T^3\,c_{2,29} + T^3\,c_{2,30})\Big]\Big],$$
$$\mathbb{E}_{\{\}\to\{1\}}\Big[\sqrt{T},\ 0,\ \in\text{Series}\Big[0,\ \frac{p_1 x_1}{2},\ e_{2,1} + p_1 x_1 e_{2,2} + p_1^2 x_1^2 e_{2,3} + p_1^3 x_1^3 e_{2,4}\Big]\Big]\Big\}$$

Out[∘]//Short=

{ ≪1≫ }

In[∘]:=
```
unknowns = Cases[{R1,2, R̄1,2, C1, C̄1}, (c | d | e | f)$k,_, ∞] // Union
```

Out[∘]=
$\{c_{2,1}, c_{2,2}, c_{2,3}, c_{2,4}, c_{2,5}, c_{2,6}, c_{2,7}, c_{2,8}, c_{2,9}, c_{2,10}, c_{2,11}, c_{2,12}, c_{2,13}, c_{2,14}, c_{2,15}, c_{2,16}, c_{2,17}, c_{2,18}, c_{2,19}, c_{2,20}, c_{2,21}, c_{2,22}, c_{2,23}, c_{2,24}, c_{2,25}, c_{2,26}, c_{2,27}, c_{2,28}, c_{2,29}, c_{2,30}, d_{2,1}, d_{2,2}, d_{2,3}, d_{2,4}, d_{2,5}, d_{2,6}, d_{2,7}, d_{2,8}, d_{2,9}, d_{2,10}, d_{2,11}, d_{2,12}, d_{2,13}, d_{2,14}, d_{2,15}, d_{2,16}, d_{2,17}, d_{2,18}, d_{2,19}, d_{2,20}, d_{2,21}, d_{2,22}, d_{2,23}, d_{2,24}, d_{2,25}, d_{2,26}, d_{2,27}, d_{2,28}, d_{2,29}, d_{2,30}, e_{2,1}, e_{2,2}, e_{2,3}, e_{2,4}, f_{2,1}, f_{2,2}, f_{2,3}, f_{2,4}\}$

```
In[]:= Short[errors = CCF /@ Cases[RMoves, a_ == b_ :> a - b], 25]
```

Out[]//Short=

$$\left\{\frac{1}{8}\left(4 T^2 p_1^3 x_1 x_2 x_3 - 4 T^3 p_1^3 x_1 x_2 x_3 - 4 T^2 p_1^2 p_2 x_1 x_2 x_3 + 4 T^3 p_1^2 p_2 x_1 x_2 x_3 + 2 T^2 p_1 p_2^2 x_1 x_2 x_3 - 2 T^3 p_1 p_2^2 x_1 x_2 x_3 - 2 T^2 p_1^2 p_3 x_1 x_2 x_3 + 2 T^3 p_1^2 p_3 x_1 x_2 x_3 + 2 T^2 p_1^3 x_2^2 x_3 - 2 T^3 p_1^3 x_2^2 x_3 - 3 T^2 p_1^2 p_2 x_2^2 x_3 + 3 T^3 p_1^2 p_2 x_2^2 x_3 + T^2 p_1 p_2^2 x_2^2 x_3 - 3 T^3 p_1 p_2^2 x_2^2 x_3 + 2 T^4 p_1 p_2^2 x_2^2 x_3 + 2 T^3 p_1 p_2 p_3 x_2^2 x_3 - 2 T^4 p_1 p_2 p_3 x_2^2 x_3 - 4 T^3 p_1^3 x_1 x_3^2 + 4 T^4 p_1^3 x_1 x_3^2 + T^2 p_1^2 p_2 x_1 x_3^2 + T^3 p_1^2 p_2 x_1 x_3^2 - 2 T^4 p_1^2 p_2 x_1 x_3^2 - T^2 p_1^2 p_3 x_1 x_3^2 + 5 T^3 p_1^2 p_3 x_1 x_3^2 - 4 T^4 p_1^2 p_3 x_1 x_3^2 - 2 T^3 p_1 p_2 p_3 x_1 x_3^2 + 2 T^4 p_1 p_2 p_3 x_1 x_3^2 - 2 T^4 p_1^3 x_2 x_3^2 + 2 T^5 p_1^3 x_2 x_3^2 - T^3 p_1^2 p_2 x_2 x_3^2 + 2 T^4 p_1^2 p_2 x_2 x_3^2 - T^5 p_1^2 p_2 x_2 x_3^2 + 3 T^4 p_1 p_2^2 x_2 x_3^2 - 3 T^5 p_1 p_2^2 x_2 x_3^2 + T^3 p_1^2 p_3 x_2 x_3^2 + T^4 p_1^2 p_3 x_2 x_3^2 - 2 T^5 p_1^2 p_3 x_2 x_3^2 - 4 T^4 p_1 p_2 p_3 x_2 x_3^2 + 4 T^5 p_1 p_2 p_3 x_2 x_3^2 - 2 T^4 p_1^3 x_3^3 + 4 T^5 p_1^3 x_3^3 - 2 T^6 p_1^3 x_3^3 + \ll 1952 \gg + 8 T^2 p_1^3 x_3^3 c_{2,29} - 32 T^3 p_1^3 x_3^3 c_{2,29} + 48 T^4 p_1^3 x_3^3 c_{2,29} - 32 T^5 p_1^3 x_3^3 c_{2,29} + 8 T^6 p_1^3 x_3^3 c_{2,29} + 8 T^3 p_2^3 x_3^3 c_{2,29} - 24 T^4 p_2^3 x_3^3 c_{2,29} + 24 T^5 p_2^3 x_3^3 c_{2,29} - 8 T^6 p_2^3 x_3^3 c_{2,29} + 24 T^3 p_1^2 p_3 x_3^3 c_{2,29} - 72 T^4 p_1^2 p_3 x_3^3 c_{2,29} + 72 T^5 p_1^2 p_3 x_3^3 c_{2,29} - 24 T^6 p_1^2 p_3 x_3^3 c_{2,29} - 24 T^3 p_2^2 p_3 x_3^3 c_{2,29} + 72 T^4 p_2^2 p_3 x_3^3 c_{2,29} - 72 T^5 p_2^2 p_3 x_3^3 c_{2,29} + 24 T^6 p_2^2 p_3 x_3^3 c_{2,29} + 24 T^4 p_1 p_3^2 x_3^3 c_{2,29} - 48 T^5 p_1 p_3^2 x_3^3 c_{2,29} + 24 T^6 p_1 p_3^2 x_3^3 c_{2,29} - 24 T^4 p_2 p_3^2 x_3^3 c_{2,29} + 48 T^5 p_2 p_3^2 x_3^3 c_{2,29} - 24 T^6 p_2 p_3^2 x_3^3 c_{2,29} + 24 T^3 p_2^3 x_2^2 x_3 c_{2,30} - 24 T^4 p_2^3 x_2^2 x_3 c_{2,30} + 24 T^3 p_2^3 x_2 x_3^2 c_{2,30} - 48 T^4 p_2^3 x_2 x_3^2 c_{2,30} + 24 T^5 p_2^3 x_2 x_3^2 c_{2,30} + 8 T^3 p_1^3 x_3^3 c_{2,30} - 24 T^4 p_1^3 x_3^3 c_{2,30} + 24 T^5 p_1^3 x_3^3 c_{2,30} - 8 T^6 p_1^3 x_3^3 c_{2,30} + 24 T^4 p_1^2 p_3 x_3^3 c_{2,30} - 48 T^5 p_1^2 p_3 x_3^3 c_{2,30} + 24 T^6 p_1^2 p_3 x_3^3 c_{2,30} - 24 T^4 p_2^2 p_3 x_3^3 c_{2,30} + 48 T^5 p_2^2 p_3 x_3^3 c_{2,30} - 24 T^6 p_2^2 p_3 x_3^3 c_{2,30} + 24 T^5 p_1 p_3^2 x_3^3 c_{2,30} - 24 T^6 p_1 p_3^2 x_3^3 c_{2,30} - 24 T^5 p_2 p_3^2 x_3^3 c_{2,30} + 24 T^6 p_2 p_3^2 x_3^3 c_{2,30}\right), \ll 7 \gg, \frac{\ll 1 \gg}{8 \ll 1 \gg}\right\}$$

```
In[]:= Short[#, 10] &[eqns =
   Thread[0 == Union @@ (CoefficientRules[#, {x1, x2, x3, p1, p2, p3}][[;; , 2]] & /@ errors)]]
```

Out[]//Short=

$$\left\{0 == c_{2,4} - T c_{2,4},\ 0 == -c_{2,4} + T c_{2,4},\ 0 == T c_{2,4} - T^2 c_{2,4},\ \ll 213 \gg,\right.$$

$$0 == -\frac{1}{4} + \frac{T}{4} + T^3 c_{2,18} - T^2 c_{2,22} + T^3 c_{2,22} + T c_{2,26} - 2 T^2 c_{2,26} + T^3 c_{2,26} - c_{2,30} + 3 T c_{2,30} - 3 T^2 c_{2,30} + T^3 c_{2,30} - d_{2,15} + 3 T d_{2,15} - 3 T^2 d_{2,15} + T^3 d_{2,15} + d_{2,16} - 2 T d_{2,16} + T^2 d_{2,16} - d_{2,17} + T d_{2,17} + d_{2,18} - f_{2,4} + 3 T f_{2,4} - 3 T^2 f_{2,4} + T^3 f_{2,4},$$

$$\left. 0 == \frac{5 T}{4} - \frac{T^2}{2} + T d_{2,2} + d_{2,3} + T d_{2,4} + d_{2,5} + 4 T d_{2,6} - 4 T^2 d_{2,6} + 2 d_{2,7} - 4 T d_{2,7} - 4 d_{2,8} + 2 T d_{2,9} - 2 T^2 d_{2,9} + d_{2,10} - 2 T d_{2,10} - 2 d_{2,11} + 18 T d_{2,15} - 36 T^2 d_{2,15} + 18 T^3 d_{2,15} + 6 d_{2,16} - 24 T d_{2,16} + 18 T^2 d_{2,16} - 12 d_{2,17} + 18 T d_{2,17} + 18 d_{2,18} + 6 T d_{2,19} - 12 T^2 d_{2,19} + 6 T^3 d_{2,19} + 2 d_{2,20} - 8 T d_{2,20} + 6 T^2 d_{2,20} - 4 d_{2,21} + 6 T d_{2,21} + 6 d_{2,22} + T f_{2,2} + 4 T f_{2,3} - 4 T^2 f_{2,3} + 18 T f_{2,4} - 36 T^2 f_{2,4} + 18 T^3 f_{2,4}\right\}$$

In[ ]:= `{sol} = Solve[eqns, unknowns]`

Solve: Equations may not give solutions for all "solve" variables.

Out[ ]= $\left\{\left\{c_{2,1}\to -\frac{c_{2,2}}{2}-\frac{c_{2,5}}{2},\ c_{2,3}\to -\frac{c_{2,2}}{T}-c_{2,5},\ c_{2,4}\to 0,\ c_{2,6}\to 0,\ c_{2,8}\to -\frac{(1-T)\ c_{2,7}}{T}-\frac{(1-T)\ c_{2,10}}{2\ T},\right.\right.$
$c_{2,9}\to 0,\ c_{2,11}\to -c_{2,7}-\frac{(1+T)\ c_{2,10}}{2\ T},\ c_{2,12}\to 0,\ c_{2,13}\to 0,\ c_{2,14}\to 0,\ c_{2,15}\to 0,$
$c_{2,17}\to -\frac{1}{4}-\frac{(1-T)\ c_{2,16}}{T},\ c_{2,18}\to -\frac{-1-2\ T+3\ T^2}{24\ T^2},\ c_{2,19}\to 0,\ c_{2,20}\to -\frac{1}{8},\ c_{2,21}\to -\frac{-1-2\ T}{8\ T},$
$c_{2,22}\to -\frac{1+T-2\ T^2}{24\ T^2}-\frac{(1-T)\ c_{2,16}}{T},\ c_{2,23}\to 0,\ c_{2,24}\to 0,\ c_{2,25}\to -\frac{1}{8},\ c_{2,26}\to -\frac{-2-T}{24\ T}-c_{2,16},$
$c_{2,27}\to 0,\ c_{2,28}\to 0,\ c_{2,29}\to 0,\ c_{2,30}\to 0,\ d_{2,1}\to \frac{c_{2,2}}{2}+\frac{c_{2,5}}{2},\ d_{2,2}\to -c_{2,2},$
$d_{2,3}\to T\ c_{2,2}+c_{2,5},\ d_{2,4}\to 0,\ d_{2,5}\to -c_{2,5},\ d_{2,6}\to 0,\ d_{2,7}\to -\frac{1}{4}-T\ c_{2,7}-(-1+T)\ c_{2,10},$
$d_{2,8}\to \frac{1}{8}\ (-1+T)-\left(T-T^2\right)\ c_{2,7}-\frac{1}{2}\ \left(-1+3\ T-2\ T^2\right)\ c_{2,10},\ d_{2,9}\to 0,\ d_{2,10}\to \frac{1}{4}-c_{2,10},$
$d_{2,11}\to \frac{1-T}{8}+T\ c_{2,7}-\frac{1}{2}\ (1-3\ T)\ c_{2,10},\ d_{2,12}\to 0,\ d_{2,13}\to 0,\ d_{2,14}\to 0,\ d_{2,15}\to 0,$
$d_{2,16}\to \frac{1+T}{8}-T\ c_{2,16},\ d_{2,17}\to \frac{1}{8}\ \left(-1-T^2\right)-\left(T-T^2\right)\ c_{2,16},\ d_{2,18}\to \frac{1}{24}\ \left(-3+2\ T+T^2\right),\ d_{2,19}\to 0,$
$d_{2,20}\to -\frac{1}{8},\ d_{2,21}\to \frac{2+T}{8},\ d_{2,22}\to \frac{1}{24}\ \left(5-T-4\ T^2\right)-\left(T-T^2\right)\ c_{2,16},\ d_{2,23}\to 0,\ d_{2,24}\to 0,\ d_{2,25}\to -\frac{1}{8},$
$d_{2,26}\to \frac{1}{24}\ (-2-T)+T\ c_{2,16},\ d_{2,27}\to 0,\ d_{2,28}\to 0,\ d_{2,29}\to 0,\ d_{2,30}\to 0,\ e_{2,1}\to -\frac{c_{2,2}}{2}-\frac{c_{2,5}}{2},$
$\left.\left.e_{2,2}\to -c_{2,10},\ e_{2,3}\to 0,\ e_{2,4}\to 0,\ f_{2,1}\to \frac{c_{2,2}}{2}+\frac{c_{2,5}}{2},\ f_{2,2}\to -\frac{1}{4}+c_{2,10},\ f_{2,3}\to 0,\ f_{2,4}\to 0\right\}\right\}$

In[ ]:= `sol /. (a_ → b_) :> (a = b)`

Out[ ]= $\left\{-\frac{c_{2,2}}{2}-\frac{c_{2,5}}{2},\ -\frac{c_{2,2}}{T}-c_{2,5},\ 0,\ 0,\ -\frac{(1-T)\ c_{2,7}}{T}-\frac{(1-T)\ c_{2,10}}{2\ T},\ 0,\ -c_{2,7}-\frac{(1+T)\ c_{2,10}}{2\ T},\ 0,\ 0,\right.$
$0,\ 0,\ -\frac{1}{4}-\frac{(1-T)\ c_{2,16}}{T},\ -\frac{-1-2\ T+3\ T^2}{24\ T^2},\ 0,\ -\frac{1}{8},\ -\frac{-1-2\ T}{8\ T},\ -\frac{1+T-2\ T^2}{24\ T^2}-\frac{(1-T)\ c_{2,16}}{T},$
$0,\ 0,\ -\frac{1}{8},\ -\frac{-2-T}{24\ T}-c_{2,16},\ 0,\ 0,\ 0,\ 0,\ \frac{c_{2,2}}{2}+\frac{c_{2,5}}{2},\ -c_{2,2},\ T\ c_{2,2}+c_{2,5},\ 0,\ -c_{2,5},\ 0,$
$-\frac{1}{4}-T\ c_{2,7}-(-1+T)\ c_{2,10},\ \frac{1}{8}\ (-1+T)-\left(T-T^2\right)\ c_{2,7}-\frac{1}{2}\ \left(-1+3\ T-2\ T^2\right)\ c_{2,10},\ 0,\ \frac{1}{4}-c_{2,10},$
$\frac{1-T}{8}+T\ c_{2,7}-\frac{1}{2}\ (1-3\ T)\ c_{2,10},\ 0,\ 0,\ 0,\ 0,\ \frac{1+T}{8}-T\ c_{2,16},\ \frac{1}{8}\ \left(-1-T^2\right)-\left(T-T^2\right)\ c_{2,16},$
$\frac{1}{24}\ \left(-3+2\ T+T^2\right),\ 0,\ -\frac{1}{8},\ \frac{2+T}{8},\ \frac{1}{24}\ \left(5-T-4\ T^2\right)-\left(T-T^2\right)\ c_{2,16},\ 0,\ 0,\ -\frac{1}{8},$
$\left.\frac{1}{24}\ (-2-T)+T\ c_{2,16},\ 0,\ 0,\ 0,\ 0,\ -\frac{c_{2,2}}{2}-\frac{c_{2,5}}{2},\ -c_{2,10},\ 0,\ 0,\ \frac{c_{2,2}}{2}+\frac{c_{2,5}}{2},\ -\frac{1}{4}+c_{2,10},\ 0,\ 0\right\}$

In[∘]:= **Cases**$\left[\left\{R_{1,2},\ \overline{R}_{1,2},\ C_1,\ \overline{C}_1\right\},\ (c\mid d\mid e\mid f)_{\$k,\_},\ \infty\right]$ // **Union**

Out[∘]= $\{c_{2,2},\ c_{2,5},\ c_{2,7},\ c_{2,10},\ c_{2,16}\}$

In[∘]:= **{Z1, Z2} = ZF /@ {Knot[10, 106], Knot[12, NonAlternating, 369]}**

KnotTheory: Loading precomputed data in KnotTheory/12N.dts.

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

Out[∘]=
$$\left\{\mathbb{E}_{\{\}\to\{1\}}\left[\frac{T^4}{1-4T+9T^2-15T^3+17T^4-15T^5+9T^6-4T^7+T^8},\right.\right.$$
$$0,\ \epsilon\text{Series}\Big[0,\ \big(3-20T+69T^2-161T^3+272T^4-328T^5+225T^6+92T^7-$$
$$548T^8+952T^9-1113T^{10}+980T^{11}-668T^{12}+349T^{13}-135T^{14}+36T^{15}-5T^{16}\big)\ \Big/$$
$$\big(2-16T+68T^2-204T^3+470T^4-872T^5+1338T^6-1720T^7+1870T^8-1720T^9+$$
$$1338T^{10}-872T^{11}+470T^{12}-204T^{13}+68T^{14}-16T^{15}+2T^{16}\big),$$
$$\big(3-40T+264T^2-1128T^3+3437T^4-7552T^5+10\,297T^6+2304T^7-67\,324T^8+259\,472T^9-$$
$$699\,066T^{10}+1\,539\,252T^{11}-2\,919\,131T^{12}+4\,882\,760T^{13}-7\,290\,870T^{14}+9\,779\,044T^{15}-$$
$$11\,816\,854T^{16}+12\,877\,354T^{17}-12\,651\,386T^{18}+11\,191\,592T^{19}-8\,896\,165T^{20}+6\,336\,738T^{21}-$$
$$4\,030\,390T^{22}+2\,278\,962T^{23}-1\,139\,320T^{24}+500\,046T^{25}-190\,857T^{26}+62\,504T^{27}-17\,215T^{28}+$$
$$3862T^{29}-668T^{30}+80T^{31}-5T^{32}-32c_{2,2}+480T\,c_{2,2}-3696T^2c_{2,2}+19\,448T^3c_{2,2}-$$
$$78\,192T^4c_{2,2}+254\,496T^5c_{2,2}-693\,960T^6c_{2,2}+1\,620\,216T^7c_{2,2}-3\,284\,656T^8c_{2,2}+$$
$$5\,831\,784T^9c_{2,2}-9\,103\,728T^{10}c_{2,2}+12\,483\,640T^{11}c_{2,2}-14\,922\,472T^{12}c_{2,2}+15\,241\,728T^{13}c_{2,2}-$$
$$12\,646\,416T^{14}c_{2,2}+7\,205\,208T^{15}c_{2,2}-7\,205\,208T^{17}c_{2,2}+12\,646\,416T^{18}c_{2,2}-15\,241\,728T^{19}c_{2,2}+$$
$$14\,922\,472T^{20}c_{2,2}-12\,483\,640T^{21}c_{2,2}+9\,103\,728T^{22}c_{2,2}-5\,831\,784T^{23}c_{2,2}+3\,284\,656T^{24}c_{2,2}-$$
$$1\,620\,216T^{25}c_{2,2}+693\,960T^{26}c_{2,2}-254\,496T^{27}c_{2,2}+78\,192T^{28}c_{2,2}-19\,448T^{29}c_{2,2}+$$
$$3696T^{30}c_{2,2}-480T^{31}c_{2,2}+32T^{32}c_{2,2}-32c_{2,5}+480T\,c_{2,5}-3696T^2c_{2,5}+19\,448T^3c_{2,5}-$$
$$78\,192T^4c_{2,5}+254\,496T^5c_{2,5}-693\,960T^6c_{2,5}+1\,620\,216T^7c_{2,5}-3\,284\,656T^8c_{2,5}+$$
$$5\,831\,784T^9c_{2,5}-9\,103\,728T^{10}c_{2,5}+12\,483\,640T^{11}c_{2,5}-14\,922\,472T^{12}c_{2,5}+15\,241\,728T^{13}c_{2,5}-$$
$$12\,646\,416T^{14}c_{2,5}+7\,205\,208T^{15}c_{2,5}-7\,205\,208T^{17}c_{2,5}+12\,646\,416T^{18}c_{2,5}-15\,241\,728T^{19}c_{2,5}+$$
$$14\,922\,472T^{20}c_{2,5}-12\,483\,640T^{21}c_{2,5}+9\,103\,728T^{22}c_{2,5}-5\,831\,784T^{23}c_{2,5}+3\,284\,656T^{24}c_{2,5}-$$
$$1\,620\,216T^{25}c_{2,5}+693\,960T^{26}c_{2,5}-254\,496T^{27}c_{2,5}+78\,192T^{28}c_{2,5}-19\,448T^{29}c_{2,5}+$$
$$3696T^{30}c_{2,5}-480T^{31}c_{2,5}+32T^{32}c_{2,5}-24c_{2,10}+352T\,c_{2,10}-2648T^2c_{2,10}+13\,592T^3c_{2,10}-$$
$$53\,208T^4c_{2,10}+168\,192T^5c_{2,10}-443\,688T^6c_{2,10}+995\,864T^7c_{2,10}-1\,920\,832T^8c_{2,10}+$$
$$3\,187\,896T^9c_{2,10}-4\,506\,304T^{10}c_{2,10}+5\,249\,976T^{11}c_{2,10}-4\,549\,000T^{12}c_{2,10}+1\,601\,312T^{13}c_{2,10}+$$
$$3\,879\,856T^{14}c_{2,10}-11\,310\,184T^{15}c_{2,10}+19\,225\,392T^{16}c_{2,10}-25\,720\,600T^{17}c_{2,10}+$$
$$29\,172\,688T^{18}c_{2,10}-28\,882\,144T^{19}c_{2,10}+25\,295\,944T^{20}c_{2,10}-19\,717\,304T^{21}c_{2,10}+$$
$$13\,701\,152T^{22}c_{2,10}-8\,475\,672T^{23}c_{2,10}+4\,648\,480T^{24}c_{2,10}-2\,244\,568T^{25}c_{2,10}+944\,232T^{26}c_{2,10}-$$
$$340\,800T^{27}c_{2,10}+103\,176T^{28}c_{2,10}-25\,304T^{29}c_{2,10}+4744T^{30}c_{2,10}-608T^{31}c_{2,10}+40T^{32}c_{2,10}\big)\ \Big/$$
$$\big(8-128T+1056T^2-5984T^3+26\,064T^4-92\,544T^5+277\,584T^6-720\,096T^7+1\,642\,328T^8-$$
$$3\,332\,448T^9+6\,069\,152T^{10}-9\,986\,912T^{11}+14\,922\,472T^{12}-20\,322\,304T^{13}+25\,292\,832T^{14}-$$
$$28\,820\,832T^{15}+30\,099\,512T^{16}-28\,820\,832T^{17}+25\,292\,832T^{18}-20\,322\,304T^{19}+$$
$$14\,922\,472T^{20}-9\,986\,912T^{21}+6\,069\,152T^{22}-3\,332\,448T^{23}+1\,642\,328T^{24}-720\,096T^{25}+$$
$$\left.\left.277\,584T^{26}-92\,544T^{27}+26\,064T^{28}-5984T^{29}+1056T^{30}-128T^{31}+8T^{32}\big)\Big]\right],\right.$$

$$\mathbb{E}_{\{\}\to\{1\}}\Big[\frac{T^4}{1-4T+9T^2-15T^3+17T^4-15T^5+9T^6-4T^7+T^8},$$

$$0,$$

$$\in\text{Series}\Big[0,$$

$$\big(3-20T+69T^2-161T^3+272T^4-328T^5+225T^6+92T^7-548T^8+$$
$$952T^9-1113T^{10}+980T^{11}-668T^{12}+349T^{13}-135T^{14}+36T^{15}-5T^{16}\big)\,\Big/$$
$$\big(2-16T+68T^2-204T^3+470T^4-872T^5+1338T^6-1720T^7+1870T^8-1720T^9+$$
$$1338T^{10}-872T^{11}+470T^{12}-204T^{13}+68T^{14}-16T^{15}+2T^{16}\big),$$

$$\big(3-40T+264T^2-1120T^3+3333T^4-6896T^5+7641T^6+9944T^7-83\,404T^8+283\,088T^9-$$
$$716\,082T^{10}+1\,514\,140T^{11}-2\,796\,883T^{12}+4\,607\,952T^{13}-6\,839\,214T^{14}+9\,183\,044T^{15}-$$
$$11\,164\,950T^{16}+12\,281\,354T^{17}-12\,199\,730T^{18}+10\,916\,784T^{19}-8\,773\,917T^{20}+6\,311\,626T^{21}-$$
$$4\,047\,406T^{22}+2\,302\,578T^{23}-1\,155\,400T^{24}+507\,686T^{25}-193\,513T^{26}+63\,160T^{27}-17\,319T^{28}+$$
$$3870T^{29}-668T^{30}+80T^{31}-5T^{32}-32c_{2,2}+480Tc_{2,2}-3696T^2c_{2,2}+19\,448T^3c_{2,2}-$$
$$78\,192T^4c_{2,2}+254\,496T^5c_{2,2}-693\,960T^6c_{2,2}+1\,620\,216T^7c_{2,2}-3\,284\,656T^8c_{2,2}+$$
$$5\,831\,784T^9c_{2,2}-9\,103\,728T^{10}c_{2,2}+12\,483\,640T^{11}c_{2,2}-14\,922\,472T^{12}c_{2,2}+15\,241\,728T^{13}c_{2,2}-$$
$$12\,646\,416T^{14}c_{2,2}+7\,205\,208T^{15}c_{2,2}-7\,205\,208T^{17}c_{2,2}+12\,646\,416T^{18}c_{2,2}-15\,241\,728T^{19}c_{2,2}+$$
$$14\,922\,472T^{20}c_{2,2}-12\,483\,640T^{21}c_{2,2}+9\,103\,728T^{22}c_{2,2}-5\,831\,784T^{23}c_{2,2}+3\,284\,656T^{24}c_{2,2}-$$
$$1\,620\,216T^{25}c_{2,2}+693\,960T^{26}c_{2,2}-254\,496T^{27}c_{2,2}+78\,192T^{28}c_{2,2}-19\,448T^{29}c_{2,2}+$$
$$3696T^{30}c_{2,2}-480T^{31}c_{2,2}+32T^{32}c_{2,2}-32c_{2,5}+480Tc_{2,5}-3696T^2c_{2,5}+19\,448T^3c_{2,5}-$$
$$78\,192T^4c_{2,5}+254\,496T^5c_{2,5}-693\,960T^6c_{2,5}+1\,620\,216T^7c_{2,5}-3\,284\,656T^8c_{2,5}+$$
$$5\,831\,784T^9c_{2,5}-9\,103\,728T^{10}c_{2,5}+12\,483\,640T^{11}c_{2,5}-14\,922\,472T^{12}c_{2,5}+15\,241\,728T^{13}c_{2,5}-$$
$$12\,646\,416T^{14}c_{2,5}+7\,205\,208T^{15}c_{2,5}-7\,205\,208T^{17}c_{2,5}+12\,646\,416T^{18}c_{2,5}-15\,241\,728T^{19}c_{2,5}+$$
$$14\,922\,472T^{20}c_{2,5}-12\,483\,640T^{21}c_{2,5}+9\,103\,728T^{22}c_{2,5}-5\,831\,784T^{23}c_{2,5}+3\,284\,656T^{24}c_{2,5}-$$
$$1\,620\,216T^{25}c_{2,5}+693\,960T^{26}c_{2,5}-254\,496T^{27}c_{2,5}+78\,192T^{28}c_{2,5}-19\,448T^{29}c_{2,5}+$$
$$3696T^{30}c_{2,5}-480T^{31}c_{2,5}+32T^{32}c_{2,5}-24c_{2,10}+352Tc_{2,10}-2648T^2c_{2,10}+13\,592T^3c_{2,10}-$$
$$53\,208T^4c_{2,10}+168\,192T^5c_{2,10}-443\,688T^6c_{2,10}+995\,864T^7c_{2,10}-1\,920\,832T^8c_{2,10}+$$
$$3\,187\,896T^9c_{2,10}-4\,506\,304T^{10}c_{2,10}+5\,249\,976T^{11}c_{2,10}-4\,549\,000T^{12}c_{2,10}+1\,601\,312T^{13}c_{2,10}+$$
$$3\,879\,856T^{14}c_{2,10}-11\,310\,184T^{15}c_{2,10}+19\,225\,392T^{16}c_{2,10}-25\,720\,600T^{17}c_{2,10}+$$
$$29\,172\,688T^{18}c_{2,10}-28\,882\,144T^{19}c_{2,10}+25\,295\,944T^{20}c_{2,10}-19\,717\,304T^{21}c_{2,10}+$$
$$13\,701\,152T^{22}c_{2,10}-8\,475\,672T^{23}c_{2,10}+4\,648\,480T^{24}c_{2,10}-2\,244\,568T^{25}c_{2,10}+944\,232T^{26}c_{2,10}-$$
$$340\,800T^{27}c_{2,10}+103\,176T^{28}c_{2,10}-25\,304T^{29}c_{2,10}+4744T^{30}c_{2,10}-608T^{31}c_{2,10}+40T^{32}c_{2,10}\big)\,\Big/$$
$$\big(8-128T+1056T^2-5984T^3+26\,064T^4-92\,544T^5+277\,584T^6-720\,096T^7+1\,642\,328T^8-$$
$$3\,332\,448T^9+6\,069\,152T^{10}-9\,986\,912T^{11}+14\,922\,472T^{12}-20\,322\,304T^{13}+25\,292\,832T^{14}-$$
$$28\,820\,832T^{15}+30\,099\,512T^{16}-28\,820\,832T^{17}+25\,292\,832T^{18}-20\,322\,304T^{19}+$$
$$14\,922\,472T^{20}-9\,986\,912T^{21}+6\,069\,152T^{22}-3\,332\,448T^{23}+1\,642\,328T^{24}-720\,096T^{25}+$$
$$277\,584T^{26}-92\,544T^{27}+26\,064T^{28}-5984T^{29}+1056T^{30}-128T^{31}+8T^{32}\big)\Big]\Big]\Big\}$$

In[ ]:=
```
{Z1⟦3, 2⟧ == Z2⟦3, 2⟧, Z1⟦3, 3⟧ - Z2⟦3, 3⟧} // Simplify
```

Out[ ]=

$$\Big\{\text{True},\ -\frac{(-1+T)^4\,T^3\,\left(1-3T+2T^2+5T^3-12T^4+18T^5-12T^6+5T^7+2T^8-3T^9+T^{10}\right)}{\left(1-T+T^2\right)\,\left(1-3T+5T^2-7T^3+5T^4-3T^5+T^6\right)^3}\Big\}$$

In[∘]:= $\{C_1, \overline{C}_1, \text{CF}[\text{CF}[Rp_{1,2} /. T \to T^{-1}][[3,3]] - \text{CF}[\overline{Rp}_{1,2}][[3,3]]]\} /.$
$\{c_{2,2} \to 0, c_{2,5} \to 0, c_{2,10} \to 1/8, c_{2,7} \to -1/8, c_{2,16} \to 1/8\}$

Out[∘]= $$\left\{\mathbb{E}_{\{\}\to\{1\}}\left[\sqrt{T}, 0, \in\text{Series}\left[0, \frac{p_1 x_1}{2}, -\frac{1}{8} p_1 x_1\right]\right], \mathbb{E}_{\{\}\to\{1\}}\left[\frac{1}{\sqrt{T}}, 0, \in\text{Series}\left[0, -\frac{1}{2} p_1 x_1, -\frac{1}{8} p_1 x_1\right]\right], 0\right\}$$

In[∘]:= $\{c_{2,2} = 0, c_{2,5} = 0, c_{2,10} = 1/8, c_{2,7} = -1/8, c_{2,16} = 1/8\};$
$\{R_{1,2}, \overline{R}_{1,2}, R_{1,2} /. T \to T^{-1}, C_1, \overline{C}_1\}$ // CF // Column

Out[∘]=

$$\mathbb{E}_{\{\}\to\{1,2\}}\Big[\sqrt{T}, (-1+T) p_1 x_2 + (1-T) p_2 x_2, \in\text{Series}\Big[0, \tfrac{1}{2} T p_1^2 x_1 x_2 - \tfrac{1}{2} T p_1 p_2 x_1 x_2 + \tfrac{1}{4}(T-T^2) p_1^2 x_2^2 + \tfrac{1}{4}(-T+T^2) p_1 p_2 x_2^2,$$
$$-\tfrac{1}{8} T p_1^2 x_1 x_2 + \tfrac{1}{8} T p_1 p_2 x_1 x_2 + \tfrac{1}{8} T p_1^3 x_1^2 x_2 - \tfrac{1}{8} T p_1^2 p_2 x_1^2 x_2 + \tfrac{1}{16}(-T+T^2) p_1^2 x_2^2 +$$
$$\tfrac{1}{16}(T-T^2) p_1 p_2 x_2^2 + \tfrac{1}{8}(T-3T^2) p_1^3 x_1 x_2^2 + \tfrac{1}{8}(-T+4T^2) p_1^2 p_2 x_1 x_2^2 - \tfrac{1}{8} T^2 p_1 p_2^2 x_1 x_2^2 +$$
$$\tfrac{1}{24}(T-4T^2+3T^3) p_1^3 x_2^3 + \tfrac{1}{24}(-T+5T^2-4T^3) p_1^2 p_2 x_2^3 + \tfrac{1}{24}(-T^2+T^3) p_1 p_2^2 x_2^3\Big]\Big]$$

$$\mathbb{E}_{\{\}\to\{1,2\}}\Big[\tfrac{1}{\sqrt{T}}, \tfrac{(1-T) p_1 x_2}{T} + \tfrac{(-1+T) p_2 x_2}{T}, \in\text{Series}\Big[0, -\tfrac{p_1^2 x_1 x_2}{2T} + \tfrac{p_1 p_2 x_1 x_2}{2T} + \tfrac{(1-T) p_1^2 x_2^2}{4T^2} + \tfrac{(-1+T) p_1 p_2 x_2^2}{4T^2},$$
$$-\tfrac{p_1^2 x_1 x_2}{8T} + \tfrac{p_1 p_2 x_1 x_2}{8T} + \tfrac{p_1^3 x_1^2 x_2}{8T} - \tfrac{p_1^2 p_2 x_1^2 x_2}{8T} + \tfrac{(1-T) p_1^2 x_2^2}{16T^2} + \tfrac{(-1+T) p_1 p_2 x_2^2}{16T^2} + \tfrac{(-3+T) p_1^3 x_1 x_2^2}{8T^2} +$$
$$\tfrac{(4-T) p_1^2 p_2 x_1 x_2^2}{8T^2} - \tfrac{p_1 p_2^2 x_1 x_2^2}{8T^2} + \tfrac{(3-4T+T^2) p_1^3 x_2^3}{24T^3} + \tfrac{(-4+5T-T^2) p_1^2 p_2 x_2^3}{24T^3} + \tfrac{(1-T) p_1 p_2^2 x_2^3}{24T^3}\Big]\Big]$$

$$\mathbb{E}_{\{\}\to\{1,2\}}\Big[\sqrt{\tfrac{1}{T}}, \tfrac{(1-T) p_1 x_2}{T} + \tfrac{(-1+T) p_2 x_2}{T},$$
$$\in\text{Series}\Big[0, \tfrac{p_1^2 x_1 x_2}{2T} - \tfrac{p_1 p_2 x_1 x_2}{2T} + \tfrac{(-1+T) p_1^2 x_2^2}{4T^2} + \tfrac{(1-T) p_1 p_2 x_2^2}{4T^2}, -\tfrac{p_1^2 x_1 x_2}{8T} + \tfrac{p_1 p_2 x_1 x_2}{8T} + \tfrac{p_1^3 x_1^2 x_2}{8T} - \tfrac{p_1^2 p_2 x_1^2 x_2}{8T} + \tfrac{(1-T) p_1^2 x_2^2}{16T^2} +$$
$$\tfrac{(-1+T) p_1 p_2 x_2^2}{16T^2} + \tfrac{(-3+T) p_1^3 x_1 x_2^2}{8T^2} + \tfrac{(4-T) p_1^2 p_2 x_1 x_2^2}{8T^2} - \tfrac{p_1 p_2^2 x_1 x_2^2}{8T^2} + \tfrac{(3-4T+T^2) p_1^3 x_2^3}{24T^3} + \tfrac{(-4+5T-T^2) p_1^2 p_2 x_2^3}{24T^3} + \tfrac{(1-T) p_1 p_2^2 x_2^3}{24T^3}\Big]\Big]$$

$$\mathbb{E}_{\{\}\to\{1\}}\Big[\sqrt{T}, 0, \in\text{Series}\Big[0, \tfrac{p_1 x_1}{2}, -\tfrac{1}{8} p_1 x_1\Big]\Big]$$

$$\mathbb{E}_{\{\}\to\{1\}}\Big[\tfrac{1}{\sqrt{T}}, 0, \in\text{Series}\Big[0, -\tfrac{1}{2} p_1 x_1, -\tfrac{1}{8} p_1 x_1\Big]\Big]$$

In[∘]:= $\text{CF}[R_{1,2} /. T \to T^{-1}][[3,3]] - \text{CF}[\overline{R}_{1,2}][[3,3]]$

Out[∘]= 0

In[∘]:= Factor /@ $Rp_{1,2}[[3]]$

Out[∘]= $$\in\text{Series}\Big[0, \frac{p_1 (p_1 - p_2) x_2 (2 T x_1 - x_2 + T x_2)}{4T},$$
$$\frac{1}{48 T^2} p_1 (p_1 - p_2) x_2 \big(-6T^2 x_1 + 6T^2 p_1 x_1^2 + 3T x_2 - 3T^2 x_2 - 6T p_1 x_1 x_2 -$$
$$6T^2 p_1 x_1 x_2 + 6T^2 p_2 x_1 x_2 + 2 p_1 x_2^2 + 4T p_1 x_2^2 - 6T^2 p_1 x_2^2 - 4T p_2 x_2^2 + 4T^2 p_2 x_2^2\big)\Big]$$

In[∘]:= Simplify /@ $Rp_{1,2}[[3]]$

Out[∘]= $$\in\text{Series}\Big[0, \frac{p_1 (p_1 - p_2) x_2 (2 T x_1 + (-1+T) x_2)}{4T}, -\frac{1}{48 T^2} p_1 (p_1 - p_2) x_2$$
$$\big(-6T^2 p_1 x_1^2 + 6T x_1 (T + (1+T) p_1 x_2 - T p_2 x_2) + (-1+T) x_2 (2(1+3T) p_1 x_2 + T(3 - 4 p_2 x_2))\big)\Big]$$

In[]:= **RMoves**

Out[]= {True, True, True, True, True, True, True, True, True}

Solving for *R*, *C*, $k = 3

In[]:= **$k = 3;**
{R1,2, C1}

Out[]= $\Big\{\mathbb{E}_{\{\}\to\{1,2\}}\Big[\sqrt{T},\ (-1+T)\ p_1\ x_2 + (1-T)\ p_2\ x_2,$
$\epsilon\text{Series}\Big[0,\ \frac{1}{2}\ T\ p_1^2\ x_1\ x_2 - \frac{1}{2}\ T\ p_1\ p_2\ x_1\ x_2 + \frac{1}{4}\ (T-T^2)\ p_1^2\ x_2^2 + \frac{1}{4}\ (-T+T^2)\ p_1\ p_2\ x_2^2,$
$-\frac{1}{8}\ T\ p_1^2\ x_1\ x_2 + \frac{1}{8}\ T\ p_1\ p_2\ x_1\ x_2 + \frac{1}{8}\ T\ p_1^3\ x_1^2\ x_2 - \frac{1}{8}\ T\ p_1^2\ p_2\ x_1^2\ x_2 + \frac{1}{16}\ (-T+T^2)\ p_1^2\ x_2^2 +$
$\frac{1}{16}\ (T-T^2)\ p_1\ p_2\ x_2^2 + \frac{1}{8}\ (T-3\ T^2)\ p_1^3\ x_1\ x_2^2 + \frac{1}{8}\ (-T+4\ T^2)\ p_1^2\ p_2\ x_1\ x_2^2 - \frac{1}{8}\ T^2\ p_1\ p_2^2\ x_1\ x_2^2 +$
$\frac{1}{24}\ (T-4\ T^2+3\ T^3)\ p_1^3\ x_2^3 + \frac{1}{24}\ (-T+5\ T^2-4\ T^3)\ p_1^2\ p_2\ x_2^3 + \frac{1}{24}\ (-T^2+T^3)\ p_1\ p_2^2\ x_2^3,$
$c_{3,1} + p_1\ x_1\ c_{3,2} + p_1\ x_2\ (c_{3,2} - T\ c_{3,2} + T\ c_{3,3}) + p_2\ x_1\ c_{3,4} + p_2\ x_2\ (c_{3,4} - T\ c_{3,4} + T\ c_{3,5}) + p_1^2\ x_1^2\ c_{3,6} +$
$p_1^2\ x_1\ x_2\ (2\ c_{3,6} - 2\ T\ c_{3,6} + T\ c_{3,7}) + p_1^2\ x_2^2\ (c_{3,6} - 2\ T\ c_{3,6} + T^2\ c_{3,6} + T\ c_{3,7} - T^2\ c_{3,7} + T^2\ c_{3,8}) +$
$p_1\ p_2\ x_1^2\ c_{3,9} + p_1\ p_2\ x_1\ x_2\ (2\ c_{3,9} - 2\ T\ c_{3,9} + T\ c_{3,10}) +$
$p_1\ p_2\ x_2^2\ (c_{3,9} - 2\ T\ c_{3,9} + T^2\ c_{3,9} + T\ c_{3,10} - T^2\ c_{3,10} + T^2\ c_{3,11}) + p_2^2\ x_1^2\ c_{3,12} +$
$p_2^2\ x_1\ x_2\ (2\ c_{3,12} - 2\ T\ c_{3,12} + T\ c_{3,13}) + p_2^2\ x_2^2\ (c_{3,12} - 2\ T\ c_{3,12} + T^2\ c_{3,12} + T\ c_{3,13} - T^2\ c_{3,13} + T^2\ c_{3,14}) +$
$p_1^3\ x_1^3\ c_{3,15} + p_1^3\ x_1^2\ x_2\ (3\ c_{3,15} - 3\ T\ c_{3,15} + T\ c_{3,16}) +$
$p_1^3\ x_1\ x_2^2\ (3\ c_{3,15} - 6\ T\ c_{3,15} + 3\ T^2\ c_{3,15} + 2\ T\ c_{3,16} - 2\ T^2\ c_{3,16} + T^2\ c_{3,17}) + p_1^3\ x_2^3$
$(c_{3,15} - 3\ T\ c_{3,15} + 3\ T^2\ c_{3,15} - T^3\ c_{3,15} + T\ c_{3,16} - 2\ T^2\ c_{3,16} + T^3\ c_{3,16} + T^2\ c_{3,17} - T^3\ c_{3,17} + T^3\ c_{3,18}) +$
$p_1^2\ p_2\ x_1^3\ c_{3,19} + p_1^2\ p_2\ x_1^2\ x_2\ (3\ c_{3,19} - 3\ T\ c_{3,19} + T\ c_{3,20}) +$
$p_1^2\ p_2\ x_1\ x_2^2\ (3\ c_{3,19} - 6\ T\ c_{3,19} + 3\ T^2\ c_{3,19} + 2\ T\ c_{3,20} - 2\ T^2\ c_{3,20} + T^2\ c_{3,21}) + p_1^2\ p_2\ x_2^3$
$(c_{3,19} - 3\ T\ c_{3,19} + 3\ T^2\ c_{3,19} - T^3\ c_{3,19} + T\ c_{3,20} - 2\ T^2\ c_{3,20} + T^3\ c_{3,20} + T^2\ c_{3,21} - T^3\ c_{3,21} + T^3\ c_{3,22}) +$
$p_1\ p_2^2\ x_1^3\ c_{3,23} + p_1\ p_2^2\ x_1^2\ x_2\ (3\ c_{3,23} - 3\ T\ c_{3,23} + T\ c_{3,24}) +$
$p_1\ p_2^2\ x_1\ x_2^2\ (3\ c_{3,23} - 6\ T\ c_{3,23} + 3\ T^2\ c_{3,23} + 2\ T\ c_{3,24} - 2\ T^2\ c_{3,24} + T^2\ c_{3,25}) + p_1\ p_2^2\ x_2^3$
$(c_{3,23} - 3\ T\ c_{3,23} + 3\ T^2\ c_{3,23} - T^3\ c_{3,23} + T\ c_{3,24} - 2\ T^2\ c_{3,24} + T^3\ c_{3,24} + T^2\ c_{3,25} - T^3\ c_{3,25} + T^3\ c_{3,26}) +$
$p_2^3\ x_1^3\ c_{3,27} + p_2^3\ x_1^2\ x_2\ (3\ c_{3,27} - 3\ T\ c_{3,27} + T\ c_{3,28}) +$
$p_2^3\ x_1\ x_2^2\ (3\ c_{3,27} - 6\ T\ c_{3,27} + 3\ T^2\ c_{3,27} + 2\ T\ c_{3,28} - 2\ T^2\ c_{3,28} + T^2\ c_{3,29}) + p_2^3\ x_2^3$
$(c_{3,27} - 3\ T\ c_{3,27} + 3\ T^2\ c_{3,27} - T^3\ c_{3,27} + T\ c_{3,28} - 2\ T^2\ c_{3,28} + T^3\ c_{3,28} + T^2\ c_{3,29} - T^3\ c_{3,29} + T^3\ c_{3,30}) +$
$p_1^4\ x_1^4\ c_{3,31} + p_1^4\ x_1^3\ x_2\ (4\ c_{3,31} - 4\ T\ c_{3,31} + T\ c_{3,32}) +$
$p_1^4\ x_1^2\ x_2^2\ (6\ c_{3,31} - 12\ T\ c_{3,31} + 6\ T^2\ c_{3,31} + 3\ T\ c_{3,32} - 3\ T^2\ c_{3,32} + T^2\ c_{3,33}) +$
$p_1^4\ x_1\ x_2^3\ (4\ c_{3,31} - 12\ T\ c_{3,31} + 12\ T^2\ c_{3,31} - 4\ T^3\ c_{3,31} + 3\ T\ c_{3,32} - 6\ T^2\ c_{3,32} + 3\ T^3\ c_{3,32} + 2\ T^2\ c_{3,33} -$
$2\ T^3\ c_{3,33} + T^3\ c_{3,34}) + p_1^4\ x_2^4\ (c_{3,31} - 4\ T\ c_{3,31} + 6\ T^2\ c_{3,31} - 4\ T^3\ c_{3,31} + T^4\ c_{3,31} + T\ c_{3,32} -$
$3\ T^2\ c_{3,32} + 3\ T^3\ c_{3,32} - T^4\ c_{3,32} + T^2\ c_{3,33} - 2\ T^3\ c_{3,33} + T^4\ c_{3,33} + T^3\ c_{3,34} - T^4\ c_{3,34} + T^4\ c_{3,35}) +$
$p_1^3\ p_2\ x_1^4\ c_{3,36} + p_1^3\ p_2\ x_1^3\ x_2\ (4\ c_{3,36} - 4\ T\ c_{3,36} + T\ c_{3,37}) +$
$p_1^3\ p_2\ x_1^2\ x_2^2\ (6\ c_{3,36} - 12\ T\ c_{3,36} + 6\ T^2\ c_{3,36} + 3\ T\ c_{3,37} - 3\ T^2\ c_{3,37} + T^2\ c_{3,38}) +$
$p_1^3\ p_2\ x_1\ x_2^3\ (4\ c_{3,36} - 12\ T\ c_{3,36} + 12\ T^2\ c_{3,36} - 4\ T^3\ c_{3,36} + 3\ T\ c_{3,37} - 6\ T^2\ c_{3,37} + 3\ T^3\ c_{3,37} + 2\ T^2\ c_{3,38} -$

$2\,T^3\,c_{3,38}+T^3\,c_{3,39}\big)+p_1^3\,p_2\,x_2^4\,\big(c_{3,36}-4\,T\,c_{3,36}+6\,T^2\,c_{3,36}-4\,T^3\,c_{3,36}+T^4\,c_{3,36}+T\,c_{3,37}-$
$3\,T^2\,c_{3,37}+3\,T^3\,c_{3,37}-T^4\,c_{3,37}+T^2\,c_{3,38}-2\,T^3\,c_{3,38}+T^4\,c_{3,38}+T^3\,c_{3,39}-T^4\,c_{3,39}+T^4\,c_{3,40}\big)+$
$p_1^2\,p_2^2\,x_1^4\,c_{3,41}+p_1^2\,p_2^2\,x_1^3\,x_2\,(4\,c_{3,41}-4\,T\,c_{3,41}+T\,c_{3,42})+$
$p_1^2\,p_2^2\,x_1^2\,x_2^2\,\big(6\,c_{3,41}-12\,T\,c_{3,41}+6\,T^2\,c_{3,41}+3\,T\,c_{3,42}-3\,T^2\,c_{3,42}+T^2\,c_{3,43}\big)+$
$p_1^2\,p_2^2\,x_1\,x_2^3\,\big(4\,c_{3,41}-12\,T\,c_{3,41}+12\,T^2\,c_{3,41}-4\,T^3\,c_{3,41}+3\,T\,c_{3,42}-6\,T^2\,c_{3,42}+3\,T^3\,c_{3,42}+2\,T^2\,c_{3,43}-$
$2\,T^3\,c_{3,43}+T^3\,c_{3,44}\big)+p_1^2\,p_2^2\,x_2^4\,\big(c_{3,41}-4\,T\,c_{3,41}+6\,T^2\,c_{3,41}-4\,T^3\,c_{3,41}+T^4\,c_{3,41}+T\,c_{3,42}-$
$3\,T^2\,c_{3,42}+3\,T^3\,c_{3,42}-T^4\,c_{3,42}+T^2\,c_{3,43}-2\,T^3\,c_{3,43}+T^4\,c_{3,43}+T^3\,c_{3,44}-T^4\,c_{3,44}+T^4\,c_{3,45}\big)+$
$p_1\,p_2^3\,x_1^4\,c_{3,46}+p_1\,p_2^3\,x_1^3\,x_2\,(4\,c_{3,46}-4\,T\,c_{3,46}+T\,c_{3,47})+$
$p_1\,p_2^3\,x_1^2\,x_2^2\,\big(6\,c_{3,46}-12\,T\,c_{3,46}+6\,T^2\,c_{3,46}+3\,T\,c_{3,47}-3\,T^2\,c_{3,47}+T^2\,c_{3,48}\big)+$
$p_1\,p_2^3\,x_1\,x_2^3\,\big(4\,c_{3,46}-12\,T\,c_{3,46}+12\,T^2\,c_{3,46}-4\,T^3\,c_{3,46}+$
$3\,T\,c_{3,47}-6\,T^2\,c_{3,47}+3\,T^3\,c_{3,47}+2\,T^2\,c_{3,48}-2\,T^3\,c_{3,48}+T^3\,c_{3,49}\big)+$
$p_1\,p_2^3\,x_2^4\,\big(c_{3,46}-4\,T\,c_{3,46}+6\,T^2\,c_{3,46}-4\,T^3\,c_{3,46}+T^4\,c_{3,46}+T\,c_{3,47}-3\,T^2\,c_{3,47}+$
$3\,T^3\,c_{3,47}-T^4\,c_{3,47}+T^2\,c_{3,48}-2\,T^3\,c_{3,48}+T^4\,c_{3,48}+T^3\,c_{3,49}-T^4\,c_{3,49}+T^4\,c_{3,50}\big)+$
$p_2^4\,x_1^4\,c_{3,51}+p_2^4\,x_1^3\,x_2\,(4\,c_{3,51}-4\,T\,c_{3,51}+T\,c_{3,52})+$
$p_2^4\,x_1^2\,x_2^2\,\big(6\,c_{3,51}-12\,T\,c_{3,51}+6\,T^2\,c_{3,51}+3\,T\,c_{3,52}-3\,T^2\,c_{3,52}+T^2\,c_{3,53}\big)+$
$p_2^4\,x_1\,x_2^3\,\big(4\,c_{3,51}-12\,T\,c_{3,51}+12\,T^2\,c_{3,51}-4\,T^3\,c_{3,51}+$
$3\,T\,c_{3,52}-6\,T^2\,c_{3,52}+3\,T^3\,c_{3,52}+2\,T^2\,c_{3,53}-2\,T^3\,c_{3,53}+T^3\,c_{3,54}\big)+$
$p_2^4\,x_2^4\,\big(c_{3,51}-4\,T\,c_{3,51}+6\,T^2\,c_{3,51}-4\,T^3\,c_{3,51}+T^4\,c_{3,51}+T\,c_{3,52}-3\,T^2\,c_{3,52}+3\,T^3\,c_{3,52}-$
$T^4\,c_{3,52}+T^2\,c_{3,53}-2\,T^3\,c_{3,53}+T^4\,c_{3,53}+T^3\,c_{3,54}-T^4\,c_{3,54}+T^4\,c_{3,55}\big)\big]\big],$

$\mathbb{E}_{\{\}\to\{1\}}\Big[\sqrt{T},\,0,\,\in\text{Series}\Big[0,\,\frac{p_1\,x_1}{2},\,-\frac{1}{8}\,p_1\,x_1,\,e_{3,1}+p_1\,x_1\,e_{3,2}+p_1^2\,x_1^2\,e_{3,3}+p_1^3\,x_1^3\,e_{3,4}+p_1^4\,x_1^4\,e_{3,5}\Big]\Big]\Big\}$

In[ ]:= **unknowns = Cases[{$R_{1,2}$, $\overline{R}_{1,2}$, C_1, $\overline{C}_1$}, (c | d | e | f)$_{\$k,\_}$, ∞] // Union**

Out[ ]= $\{c_{3,1}, c_{3,2}, c_{3,3}, c_{3,4}, c_{3,5}, c_{3,6}, c_{3,7}, c_{3,8}, c_{3,9}, c_{3,10}, c_{3,11}, c_{3,12}, c_{3,13}, c_{3,14}, c_{3,15}, c_{3,16},$
$c_{3,17}, c_{3,18}, c_{3,19}, c_{3,20}, c_{3,21}, c_{3,22}, c_{3,23}, c_{3,24}, c_{3,25}, c_{3,26}, c_{3,27}, c_{3,28}, c_{3,29}, c_{3,30}, c_{3,31},$
$c_{3,32}, c_{3,33}, c_{3,34}, c_{3,35}, c_{3,36}, c_{3,37}, c_{3,38}, c_{3,39}, c_{3,40}, c_{3,41}, c_{3,42}, c_{3,43}, c_{3,44}, c_{3,45},$
$c_{3,46}, c_{3,47}, c_{3,48}, c_{3,49}, c_{3,50}, c_{3,51}, c_{3,52}, c_{3,53}, c_{3,54}, c_{3,55}, d_{3,1}, d_{3,2}, d_{3,3}, d_{3,4}, d_{3,5},$
$d_{3,6}, d_{3,7}, d_{3,8}, d_{3,9}, d_{3,10}, d_{3,11}, d_{3,12}, d_{3,13}, d_{3,14}, d_{3,15}, d_{3,16}, d_{3,17}, d_{3,18}, d_{3,19}, d_{3,20},$
$d_{3,21}, d_{3,22}, d_{3,23}, d_{3,24}, d_{3,25}, d_{3,26}, d_{3,27}, d_{3,28}, d_{3,29}, d_{3,30}, d_{3,31}, d_{3,32}, d_{3,33}, d_{3,34}, d_{3,35},$
$d_{3,36}, d_{3,37}, d_{3,38}, d_{3,39}, d_{3,40}, d_{3,41}, d_{3,42}, d_{3,43}, d_{3,44}, d_{3,45}, d_{3,46}, d_{3,47}, d_{3,48}, d_{3,49},$
$d_{3,50}, d_{3,51}, d_{3,52}, d_{3,53}, d_{3,54}, d_{3,55}, e_{3,1}, e_{3,2}, e_{3,3}, e_{3,4}, e_{3,5}, f_{3,1}, f_{3,2}, f_{3,3}, f_{3,4}, f_{3,5}\}$

In[]:= **Short[errors = CCF /@ Cases[RMoves, a_ == b_ :> a - b], 25]**

Out[]//Short=

$$\left\{\frac{1}{192}\left(-72 T^2 p_1^3 x_1 x_2 x_3 + 72 T^3 p_1^3 x_1 x_2 x_3 + 72 T^2 p_1^2 p_2 x_1 x_2 x_3 - 72 T^3 p_1^2 p_2 x_1 x_2 x_3 - 24 T^2 p_1 p_2^2 x_1 x_2 x_3 + 24 T^3 p_1 p_2^2 x_1 x_2 x_3 + 24 T^2 p_1^2 p_3 x_1 x_2 x_3 - 24 T^3 p_1^2 p_3 x_1 x_2 x_3 + 84 T^2 p_1^4 x_1^2 x_2 x_3 - 84 T^3 p_1^4 x_1^2 x_2 x_3 - 120 T^2 p_1^3 p_2 x_1^2 x_2 x_3 + 120 T^3 p_1^3 p_2 x_1^2 x_2 x_3 + 48 T^2 p_1^2 p_2^2 x_1^2 x_2 x_3 - 48 T^3 p_1^2 p_2^2 x_1^2 x_2 x_3 - 12 T^2 p_1^3 p_3 x_1^2 x_2 x_3 + 12 T^3 p_1^3 p_3 x_1^2 x_2 x_3 - 36 T^2 p_1^3 x_2^2 x_3 + 36 T^3 p_1^3 x_2^2 x_3 + 48 T^2 p_1^2 p_2 x_2^2 x_3 - 48 T^3 p_1^2 p_2 x_2^2 x_3 - 12 T^2 p_1 p_2^2 x_2^2 x_3 + 36 T^3 p_1 p_2^2 x_2^2 x_3 - 24 T^4 p_1 p_2^2 x_2^2 x_3 - 24 T^3 p_1 p_2 p_3 x_2^2 x_3 + 24 T^4 p_1 p_2 p_3 x_2^2 x_3 + 108 T^2 p_1^4 x_1 x_2^2 x_3 - 204 T^3 p_1^4 x_1 x_2^2 x_3 + 96 T^4 p_1^4 x_1 x_2^2 x_3 - 156 T^2 p_1^3 p_2 x_1 x_2^2 x_3 + 324 T^3 p_1^3 p_2 x_1 x_2^2 x_3 - 168 T^4 p_1^3 p_2 x_1 x_2^2 x_3 + 60 T^2 p_1^2 p_2^2 x_1 x_2^2 x_3 - 156 T^3 p_1^2 p_2^2 x_1 x_2^2 x_3 + 96 T^4 p_1^2 p_2^2 x_1 x_2^2 x_3 + 12 T^3 p_1 p_2^3 x_1 x_2^2 x_3 - 12 T^4 p_1 p_2^3 x_1 x_2^2 x_3 - 12 T^2 p_1^3 p_3 x_1 x_2^2 x_3 + \ll 8105 \gg + 768 T^8 p_1 p_3^3 x_3^4 c_{3,54} - 768 T^6 p_2 p_3^3 x_3^4 c_{3,54} + 1536 T^7 p_2 p_3^3 x_3^4 c_{3,54} - 768 T^8 p_2 p_3^3 x_3^4 c_{3,54} + 768 T^4 p_2^4 x_2^3 x_3 c_{3,55} - 768 T^5 p_2^4 x_2^3 x_3 c_{3,55} + 1152 T^4 p_2^4 x_2^2 x_3^2 c_{3,55} - 2304 T^5 p_2^4 x_2^2 x_3^2 c_{3,55} + 1152 T^6 p_2^4 x_2^2 x_3^2 c_{3,55} + 768 T^4 p_2^4 x_2 x_3^3 c_{3,55} - 2304 T^5 p_2^4 x_2 x_3^3 c_{3,55} + 2304 T^6 p_2^4 x_2 x_3^3 c_{3,55} - 768 T^7 p_2^4 x_2 x_3^3 c_{3,55} + 192 T^4 p_1^4 x_3^4 c_{3,55} - 768 T^5 p_1^4 x_3^4 c_{3,55} + 1152 T^6 p_1^4 x_3^4 c_{3,55} - 768 T^7 p_1^4 x_3^4 c_{3,55} + 192 T^8 p_1^4 x_3^4 c_{3,55} + 768 T^5 p_1^3 p_3 x_3^4 c_{3,55} - 2304 T^6 p_1^3 p_3 x_3^4 c_{3,55} + 2304 T^7 p_1^3 p_3 x_3^4 c_{3,55} - 768 T^8 p_1^3 p_3 x_3^4 c_{3,55} - 768 T^5 p_2^3 p_3 x_3^4 c_{3,55} + 2304 T^6 p_2^3 p_3 x_3^4 c_{3,55} - 2304 T^7 p_2^3 p_3 x_3^4 c_{3,55} + 768 T^8 p_2^3 p_3 x_3^4 c_{3,55} + 1152 T^6 p_1^2 p_3^2 x_3^4 c_{3,55} - 2304 T^7 p_1^2 p_3^2 x_3^4 c_{3,55} + 1152 T^8 p_1^2 p_3^2 x_3^4 c_{3,55} - 1152 T^6 p_2^2 p_3^2 x_3^4 c_{3,55} + 2304 T^7 p_2^2 p_3^2 x_3^4 c_{3,55} - 1152 T^8 p_2^2 p_3^2 x_3^4 c_{3,55} + 768 T^7 p_1 p_3^3 x_3^4 c_{3,55} - 768 T^8 p_1 p_3^3 x_3^4 c_{3,55} - 768 T^7 p_2 p_3^3 x_3^4 c_{3,55} + 768 T^8 p_2 p_3^3 x_3^4 c_{3,55}\right), \frac{\ll 1 \gg}{\ll 1 \gg}, \ll 6 \gg, \frac{\ll 1 \gg}{48 \ll 1 \gg}\right\}$$

In[]:= **Short[#, 10] &[eqns = Thread[0 == Union @@ (CoefficientRules[#, {x₁, x₂, x₃, p₁, p₂, p₃}][[;; , 2]] & /@ errors)]]**

Out[]//Short=

$$\{0 == c_{3,4} - T c_{3,4},\ 0 == -c_{3,4} + T c_{\ll 1 \gg},\ \ll 490 \gg,\ 0 == \ll 1 \gg,$$
$$0 == \frac{9}{16} + \frac{5T}{16} - \frac{19T^2}{16} + \frac{3T^3}{16} + T^2 d_{3,6} + T d_{3,7} + d_{3,8} + T^2 d_{3,9} + T d_{3,10} + d_{3,11} + T^2 d_{3,12} + T d_{3,13} + d_{3,14} + 9 T^2 d_{3,15} - 9 T^3 d_{3,15} + 6 T d_{3,16} - 9 T^2 d_{3,16} + 3 d_{3,17} - 9 T d_{3,17} - 9 d_{3,18} + 6 T^2 d_{3,19} - 6 T^3 d_{3,19} + 4 T d_{3,20} - 6 T^2 d_{3,20} + 2 d_{3,21} - 6 T d_{3,21} - 6 d_{3,22} + 3 T^2 d_{3,23} - 3 T^3 d_{3,23} + 2 T d_{3,24} - 3 T^2 d_{3,24} + d_{3,25} - 3 T d_{3,25} - 3 d_{3,26} + \ll 14 \gg + 72 T d_{3,34} + 72 d_{3,35} + 36 T^2 d_{3,36} - 72 T^3 d_{3,36} + 36 T^4 d_{3,36} + 18 T d_{3,37} - 54 T^2 d_{3,37} + 36 T^3 d_{3,37} + 6 d_{3,38} - 36 T d_{3,38} + 36 T^2 d_{3,38} - 18 d_{3,39} + 36 T d_{3,39} + 36 d_{3,40} + 12 T^2 d_{3,41} - 24 T^3 d_{3,41} + 12 T^4 d_{3,41} + 6 T d_{3,42} - 18 T^2 d_{3,42} + 12 T^3 d_{3,42} + 2 d_{3,43} - 12 T d_{3,43} + 12 T^2 d_{3,43} - 6 d_{3,44} + 12 T d_{3,44} + 12 d_{3,45} + T^2 f_{3,3} + 9 T^2 f_{3,4} - 9 T^3 f_{3,4} + 72 T^2 f_{3,5} - 144 T^3 f_{3,5} + 72 T^4 f_{3,5}\}$$

In[]:= **{sol} = Solve[eqns, unknowns]**

Solve: Equations may not give solutions for all "solve" variables.

Out[]=

$$\left\{\left\{c_{3,1} \to -\frac{c_{3,2}}{2} - \frac{c_{3,5}}{2},\ c_{3,3} \to -\frac{c_{3,2}}{T} - c_{3,5},\ c_{3,4} \to 0,\ c_{3,6} \to 0,\ c_{3,8} \to -\frac{(1-T)\, c_{3,7}}{T} - \frac{(1-T)\, c_{3,10}}{2T},\right.\right.$$
$$c_{3,9} \to 0,\ c_{3,11} \to -c_{3,7} - \frac{(1+T)\, c_{3,10}}{2T},\ c_{3,12} \to 0,\ c_{3,13} \to 0,\ c_{3,14} \to 0,\ c_{3,15} \to 0,$$
$$c_{3,17} \to \frac{3}{16} - \frac{(1-T)\, c_{3,16}}{T},\ c_{3,18} \to -\frac{1 + 4T - 5T^2}{48 T^2},\ c_{3,19} \to 0,\ c_{3,20} \to \frac{1}{16},\ c_{3,21} \to -\frac{1 + 3T}{16 T},$$

$c_{3,22} \to -\frac{-1-3T+4T^2}{48T^2} - \frac{(1-T)\,c_{3,16}}{T}$, $c_{3,23} \to 0$, $c_{3,24} \to 0$, $c_{3,25} \to \frac{1}{16}$, $c_{3,26} \to -\frac{2+T}{48T} - c_{3,16}$,

$c_{3,27} \to 0$, $c_{3,28} \to 0$, $c_{3,29} \to 0$, $c_{3,30} \to 0$, $c_{3,31} \to 0$, $c_{3,33} \to -\frac{7}{32} + \frac{3(-1+T)\,c_{3,32}}{2T}$,

$c_{3,34} \to -\frac{-2+T}{8T} - \frac{\left(-1+2T-T^2\right)c_{3,32}}{T^2}$, $c_{3,35} \to -\frac{-1+18T-15T^2-2T^3}{192T^3} - \frac{\left(1-3T+3T^2-T^3\right)c_{3,32}}{2T^3}$,

$c_{3,36} \to 0$, $c_{3,37} \to -\frac{1}{48}$, $c_{3,38} \to -\frac{-1-10T}{32T}$, $c_{3,39} \to -\frac{1+17T-6T^2}{48T^2}$,

$c_{3,40} \to -\frac{-1-25T+17T^2+9T^3}{192T^3} - \frac{\left(1-2T+T^2\right)c_{3,32}}{T^2}$, $c_{3,41} \to 0$, $c_{3,42} \to 0$, $c_{3,43} \to -\frac{1}{8}$,

$c_{3,44} \to \frac{7}{48T}$, $c_{3,45} \to -\frac{3-T-2T^2}{64T^2} + \frac{3(-1+T)\,c_{3,32}}{2T}$, $c_{3,46} \to 0$, $c_{3,47} \to 0$, $c_{3,48} \to 0$,

$c_{3,49} \to -\frac{1}{48}$, $c_{3,50} \to -\frac{-3-T}{192T} - c_{3,32}$, $c_{3,51} \to 0$, $c_{3,52} \to 0$, $c_{3,53} \to 0$, $c_{3,54} \to 0$, $c_{3,55} \to 0$,

$d_{3,1} \to \frac{c_{3,2}}{2} + \frac{c_{3,5}}{2}$, $d_{3,2} \to -c_{3,2}$, $d_{3,3} \to T\,c_{3,2} + c_{3,5}$, $d_{3,4} \to 0$, $d_{3,5} \to -c_{3,5}$, $d_{3,6} \to 0$,

$d_{3,7} \to -T\,c_{3,7} - (-1+T)\,c_{3,10}$, $d_{3,8} \to -\left(\left(T-T^2\right)c_{3,7}\right) - \frac{1}{2}\left(-1+3T-2T^2\right)c_{3,10}$, $d_{3,9} \to 0$,

$d_{3,10} \to -c_{3,10}$, $d_{3,11} \to T\,c_{3,7} - \frac{1}{2}(1-3T)\,c_{3,10}$, $d_{3,12} \to 0$, $d_{3,13} \to 0$, $d_{3,14} \to 0$, $d_{3,15} \to 0$,

$d_{3,16} \to \frac{1-T}{16} - T\,c_{3,16}$, $d_{3,17} \to \frac{1}{16}\left(-2-2T+T^2\right) - \left(T-T^2\right)c_{3,16}$, $d_{3,18} \to \frac{1}{48}\left(-5+4T+T^2\right)$,

$d_{3,19} \to 0$, $d_{3,20} \to -\frac{1}{16}$, $d_{3,21} \to \frac{3+T}{16}$, $d_{3,22} \to \frac{1}{48}\left(7-9T+2T^2\right) - \left(T-T^2\right)c_{3,16}$,

$d_{3,23} \to 0$, $d_{3,24} \to 0$, $d_{3,25} \to -\frac{1}{16}$, $d_{3,26} \to \frac{1}{48}(-2+5T) + T\,c_{3,16}$, $d_{3,27} \to 0$,

$d_{3,28} \to 0$, $d_{3,29} \to 0$, $d_{3,30} \to 0$, $d_{3,31} \to 0$, $d_{3,32} \to \frac{1}{48}(-1+T) - T\,c_{3,32}$,

$d_{3,33} \to \frac{1}{32}\left(6+2T-T^2\right) + \frac{3}{2}\left(-T+T^2\right)c_{3,32}$, $d_{3,34} \to \frac{1}{48}\left(5-9T-3T^2+T^3\right) - \left(T-2T^2+T^3\right)c_{3,32}$,

$d_{3,35} \to \frac{1}{192}\left(-4-7T+6T^2+7T^3-2T^4\right) - \frac{1}{2}\left(T-3T^2+3T^3-T^4\right)c_{3,32}$,

$d_{3,36} \to 0$, $d_{3,37} \to \frac{1}{48}$, $d_{3,38} \to \frac{1}{32}(-10-T)$, $d_{3,39} \to \frac{1}{48}\left(-6+17T+T^2\right)$,

$d_{3,40} \to \frac{1}{192}\left(13+5T-13T^2-5T^3\right) - \left(-T+2T^2-T^3\right)c_{3,32}$, $d_{3,41} \to 0$, $d_{3,42} \to 0$,

$d_{3,43} \to \frac{1}{8}$, $d_{3,44} \to -\frac{7T}{48}$, $d_{3,45} \to \frac{1}{64}\left(-4+3T+T^2\right) + \frac{3}{2}(-1+T)\,T\,c_{3,32}$, $d_{3,46} \to 0$,

$d_{3,47} \to 0$, $d_{3,48} \to 0$, $d_{3,49} \to \frac{1}{48}$, $d_{3,50} \to \frac{1}{192}(3-7T) + T\,c_{3,32}$, $d_{3,51} \to 0$, $d_{3,52} \to 0$,

$d_{3,53} \to 0$, $d_{3,54} \to 0$, $d_{3,55} \to 0$, $e_{3,1} \to -\frac{c_{3,2}}{2} - \frac{c_{3,5}}{2}$, $e_{3,2} \to -c_{3,10}$, $e_{3,3} \to 0$,

$$e_{3,4}\to 0,\ e_{3,5}\to 0,\ f_{3,1}\to \frac{c_{3,2}}{2}+\frac{c_{3,5}}{2},\ f_{3,2}\to c_{3,10},\ f_{3,3}\to 0,\ f_{3,4}\to 0,\ f_{3,5}\to 0\}\}$$

In[ ]:= **sol /. (a_ → b_) :→ (a == b)**

Out[ ]=

$$\Big\{-\frac{c_{3,2}}{2}-\frac{c_{3,5}}{2},\ -\frac{c_{3,2}}{T}-c_{3,5},\ 0,\ 0,\ -\frac{(1-T)\,c_{3,7}}{T}-\frac{(1-T)\,c_{3,10}}{2\,T},\ 0,\ -c_{3,7}-\frac{(1+T)\,c_{3,10}}{2\,T},\ 0,\ 0,\ 0,$$

$$0,\ \frac{3}{16}-\frac{(1-T)\,c_{3,16}}{T},\ -\frac{1+4\,T-5\,T^2}{48\,T^2},\ 0,\ \frac{1}{16},\ -\frac{1+3\,T}{16\,T},\ -\frac{-1-3\,T+4\,T^2}{48\,T^2}-\frac{(1-T)\,c_{3,16}}{T},\ 0,$$

$$0,\ \frac{1}{16},\ -\frac{2+T}{48\,T}-c_{3,16},\ 0,\ 0,\ 0,\ 0,\ 0,\ -\frac{7}{32}+\frac{3\,(-1+T)\,c_{3,32}}{2\,T},\ -\frac{-2+T}{8\,T}-\frac{\left(-1+2\,T-T^2\right)c_{3,32}}{T^2},$$

$$-\frac{-1+18\,T-15\,T^2-2\,T^3}{192\,T^3}-\frac{\left(1-3\,T+3\,T^2-T^3\right)c_{3,32}}{2\,T^3},\ 0,\ -\frac{1}{48},\ -\frac{-1-10\,T}{32\,T},\ -\frac{1+17\,T-6\,T^2}{48\,T^2},$$

$$-\frac{-1-25\,T+17\,T^2+9\,T^3}{192\,T^3}-\frac{\left(1-2\,T+T^2\right)c_{3,32}}{T^2},\ 0,\ 0,\ -\frac{1}{8},\ \frac{7}{48\,T},\ -\frac{3-T-2\,T^2}{64\,T^2}+\frac{3\,(-1+T)\,c_{3,32}}{2\,T},$$

$$0,\ 0,\ 0,\ -\frac{1}{48},\ -\frac{-3-T}{192\,T}-c_{3,32},\ 0,\ 0,\ 0,\ 0,\ 0,\ \frac{c_{3,2}}{2}+\frac{c_{3,5}}{2},\ -c_{3,2},\ T\,c_{3,2}+c_{3,5},\ 0,$$

$$-c_{3,5},\ 0,\ -T\,c_{3,7}-(-1+T)\,c_{3,10},\ -\left(\left(T-T^2\right)c_{3,7}\right)-\frac{1}{2}\left(-1+3\,T-2\,T^2\right)c_{3,10},\ 0,\ -c_{3,10},$$

$$T\,c_{3,7}-\frac{1}{2}\,(1-3\,T)\,c_{3,10},\ 0,\ 0,\ 0,\ 0,\ \frac{1-T}{16}-T\,c_{3,16},\ \frac{1}{16}\left(-2-2\,T+T^2\right)-\left(T-T^2\right)c_{3,16},$$

$$\frac{1}{48}\left(-5+4\,T+T^2\right),\ 0,\ -\frac{1}{16},\ \frac{3+T}{16},\ \frac{1}{48}\left(7-9\,T+2\,T^2\right)-\left(T-T^2\right)c_{3,16},$$

$$0,\ 0,\ -\frac{1}{16},\ \frac{1}{48}\,(-2+5\,T)+T\,c_{3,16},\ 0,\ 0,\ 0,\ 0,\ 0,\ \frac{1}{48}\,(-1+T)-T\,c_{3,32},$$

$$\frac{1}{32}\left(6+2\,T-T^2\right)+\frac{3}{2}\left(-T+T^2\right)c_{3,32},\ \frac{1}{48}\left(5-9\,T-3\,T^2+T^3\right)-\left(T-2\,T^2+T^3\right)c_{3,32},$$

$$\frac{1}{192}\left(-4-7\,T+6\,T^2+7\,T^3-2\,T^4\right)-\frac{1}{2}\left(T-3\,T^2+3\,T^3-T^4\right)c_{3,32},\ 0,\ \frac{1}{48},\ \frac{1}{32}\,(-10-T),$$

$$\frac{1}{48}\left(-6+17\,T+T^2\right),\ \frac{1}{192}\left(13+5\,T-13\,T^2-5\,T^3\right)-\left(-T+2\,T^2-T^3\right)c_{3,32},\ 0,\ 0,\ \frac{1}{8},$$

$$-\frac{7\,T}{48},\ \frac{1}{64}\left(-4+3\,T+T^2\right)+\frac{3}{2}\,(-1+T)\,T\,c_{3,32},\ 0,\ 0,\ 0,\ \frac{1}{48},\ \frac{1}{192}\,(3-7\,T)+T\,c_{3,32},$$

$$0,\ 0,\ 0,\ 0,\ 0,\ -\frac{c_{3,2}}{2}-\frac{c_{3,5}}{2},\ -c_{3,10},\ 0,\ 0,\ 0,\ \frac{c_{3,2}}{2}+\frac{c_{3,5}}{2},\ c_{3,10},\ 0,\ 0,\ 0\Big\}$$

In[ ]:= **Cases**$\left[\left\{R_{1,2},\ \overline{R}_{1,2},\ C_1,\ \overline{C}_1\right\},\ (c\,|\,d\,|\,e\,|\,f)_{\$k,\_},\ \infty\right]$ **// Union**

Out[ ]= $\{c_{3,2},\ c_{3,5},\ c_{3,7},\ c_{3,10},\ c_{3,16},\ c_{3,32}\}$

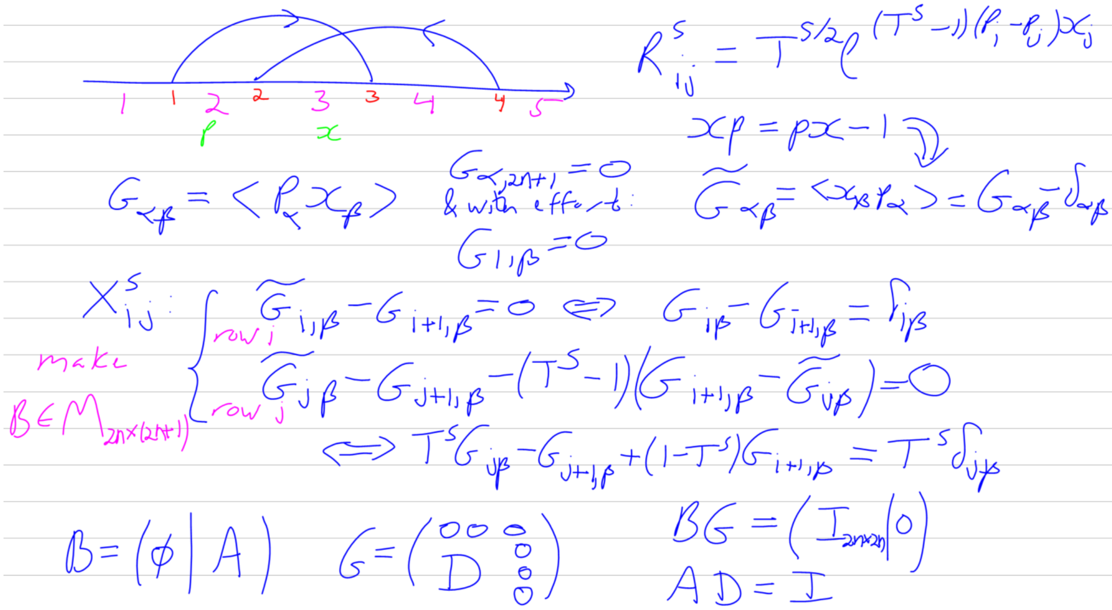
In[ ]:= **CF**$\left[\left\{C_1,\ \left(C_1[\![3,4]\!]\ /.\ T\to T^{-1}\right)+\overline{C}_1[\![3,4]\!],\ \left(Rp_{1,2}\ /.\ T\to T^{-1}\right)[\![3,4]\!]+\overline{Rp}_{1,2}[\![3,4]\!]\right\}\ /.\ \{c_{3,32}\to 1/48,\ c_{3,16}\to -1/16,\ c_{3,10}\to -c_{3,7}\}\right]$

Out[ ]= $\left\{\mathbb{E}_{\{\}\to\{1\}}\left[\sqrt{T},\ 0,\ \epsilon\text{Series}\left[0,\ \frac{p_1\,x_1}{2},\ -\frac{1}{8}\,p_1\,x_1,\ \frac{1}{2}\,(-c_{3,2}-c_{3,5})+p_1\,x_1\,c_{3,7}\right]\right],\ 0,\ 0\right\}$

In[ ]:= CF[Rp$_{1,2}$ /. {c$_{3,32}$ → 1 / 48, c$_{3,16}$ → -1 / 16, c$_{3,10}$ → -c$_{3,7}$}]

Out[ ]= $$\mathbb{E}_{\{\}\to\{1,2\}}\Big[1, 0, \epsilon\text{Series}\Big[0, \frac{1}{2} p_1^2 x_1 x_2 - \frac{1}{2} p_1 p_2 x_1 x_2 + \frac{(-1+T) p_1^2 x_2^2}{4 T} + \frac{(1-T) p_1 p_2 x_2^2}{4 T},$$
$$-\frac{1}{8} p_1^2 x_1 x_2 + \frac{1}{8} p_1 p_2 x_1 x_2 + \frac{1}{8} p_1^3 x_1^2 x_2 - \frac{1}{8} p_1^2 p_2 x_1^2 x_2 + \frac{(1-T) p_1^2 x_2^2}{16 T} +$$
$$\frac{(-1+T) p_1 p_2 x_2^2}{16 T} + \frac{(-1-T) p_1^3 x_1 x_2^2}{8 T} + \frac{(1+2 T) p_1^2 p_2 x_1 x_2^2}{8 T} - \frac{1}{8} p_1 p_2^2 x_1 x_2^2 +$$
$$\frac{(1+2 T-3 T^2) p_1^3 x_2^3}{24 T^2} + \frac{(-1-4 T+5 T^2) p_1^2 p_2 x_2^3}{24 T^2} + \frac{(1-T) p_1 p_2^2 x_2^3}{12 T},$$
$$-\frac{1}{16} p_1^3 x_1^2 x_2 + \frac{1}{16} p_1^2 p_2 x_1^2 x_2 + \frac{1}{48} p_1^4 x_1^3 x_2 - \frac{1}{48} p_1^3 p_2 x_1^3 x_2 + \frac{(1+2 T) p_1^3 x_1 x_2^2}{16 T} +$$
$$\frac{(-1-3 T) p_1^2 p_2 x_1 x_2^2}{16 T} + \frac{1}{16} p_1 p_2^2 x_1 x_2^2 + \frac{(-1-6 T) p_1^4 x_1^2 x_2^2}{32 T} + \frac{(1+10 T) p_1^3 p_2 x_1^2 x_2^2}{32 T} -$$
$$\frac{1}{8} p_1^2 p_2^2 x_1^2 x_2^2 + \frac{(-1-4 T+5 T^2) p_1^3 x_2^3}{48 T^2} + \frac{(1+6 T-7 T^2) p_1^2 p_2 x_2^3}{48 T^2} + \frac{(-1+T) p_1 p_2^2 x_2^3}{24 T} +$$
$$\frac{(1+10 T-5 T^2) p_1^4 x_1 x_2^3}{48 T^2} + \frac{(-1-17 T+6 T^2) p_1^3 p_2 x_1 x_2^3}{48 T^2} + \frac{7 p_1^2 p_2^2 x_1 x_2^3}{48 T} - \frac{1}{48} p_1 p_2^3 x_1 x_2^3 +$$
$$\frac{(-1-12 T+9 T^2+4 T^3) p_1^4 x_2^4}{192 T^3} + \frac{(1+21 T-9 T^2-13 T^3) p_1^3 p_2 x_2^4}{192 T^3} + \frac{(-3-T+4 T^2) p_1^2 p_2^2 x_2^4}{64 T^2} +$$
$$\frac{(1-T) p_1 p_2^3 x_2^4}{64 T} + p_1 x_1 c_{3,2} + \frac{1}{2} (-c_{3,2} - c_{3,5}) + p_2 x_2 c_{3,5} + \frac{p_1 x_2 (-c_{3,2} - T c_{3,5})}{T} +$$
$$p_1^2 x_1 x_2 c_{3,7} - p_1 p_2 x_1 x_2 c_{3,7} + \frac{p_1 p_2 x_2^2 (c_{3,7} - T c_{3,7})}{2 T} + \frac{p_1^2 x_2^2 (-c_{3,7} + T c_{3,7})}{2 T}\Big]\Big]$$

Fast ρ_1



In[ ]:=
```
PAB1[K_] := Module[{Cs, Rs, n, B, A, c, s, i, j, ρ0, G, ρ1},
  {Cs, Rs} = List @@ RVK[K]; n = Length[Cs];
  B = Table[0, 2 n, 2 n + 1];
  Do[s = If[Head[c] === Xp, 1, -1]; {i, j} = List @@ c;
   B[[i, {i, i + 1}]] = {1, -1}; B[[j, {j, j + 1, i + 1}]] = {1, -T^-s, T^-s - 1},
   {c, Cs}];
  ρ0 = Det[A = B[[All, 2 ;;]]] // Factor;
  G = Prepend[Table[0, 2 n]][Inverse[A]];
  ρ1 = Factor[1/2 Plus[
      Sum[s = If[Head[c] === Xp, 1, -1]; {i, j} = List @@ c;
       s (2 G[[i, i]] G[[i, j]] - G[[i, i]] G[[j, j]] -
          G[[i, j]] G[[j, i]] + (1 - T^-s) (G[[i, j]]^2 - G[[i, j]] G[[j, j]])), {c, Cs}],
      Sum[Rs[[k]] G[[k, k]], {k, 2 n}] ]];
  {ρ0, ρ1} ]
```

In[ ]:= `$k = 1; CF /@ {Rp_{1,2}, \overline{Rp}_{1,2}, C_1, \overline{C}_1}`

Out[ ]=
$$\Big\{\mathbb{E}_{\{\}\to\{1,2\}}\Big[1,\ 0,\ \epsilon\text{Series}\Big[0,\ \frac{1}{2}p_1^2x_1x_2-\frac{1}{2}p_1p_2x_1x_2+\frac{(-1+T)\,p_1^2x_2^2}{4T}+\frac{(1-T)\,p_1p_2x_2^2}{4T}\Big]\Big],$$
$$\mathbb{E}_{\{\}\to\{1,2\}}\Big[1,\ 0,\ \epsilon\text{Series}\Big[0,\ -\frac{1}{2}p_1^2x_1x_2+\frac{1}{2}p_1p_2x_1x_2+\frac{1}{4}(-1+T)\,p_1^2x_2^2+\frac{1}{4}(1-T)\,p_1p_2x_2^2\Big]\Big],$$
$$\mathbb{E}_{\{\}\to\{1\}}\Big[\sqrt{T},\ 0,\ \epsilon\text{Series}\Big[0,\ \frac{p_1x_1}{2}\Big]\Big],\ \mathbb{E}_{\{\}\to\{1\}}\Big[\frac{1}{\sqrt{T}},\ 0,\ \epsilon\text{Series}\Big[0,\ -\frac{1}{2}p_1x_1\Big]\Big]\Big\}$$

In[∘]:=
```
K = GST48;
Alexander[K][T]
```

Out[∘]=
$$13-\frac{1}{T^8}+\frac{2}{T^7}-\frac{1}{T^6}-\frac{2}{T^4}+\frac{5}{T^3}-\frac{2}{T^2}-\frac{7}{T}-7\,T-2\,T^2+5\,T^3-2\,T^4-T^6+2\,T^7-T^8$$

In[∘]:=
```
Timing@PAB1[K]
```

Out[∘]=
$$\Big\{48.0938,\ \Big\{-\frac{\left(-1+2\,T-T^2-T^3+2\,T^4-T^5+T^8\right)\left(-1+T^3-2\,T^4+T^5+T^6-2\,T^7+T^8\right)}{T^7},$$
$$-\Big(\Big((-1+T)\,\big(13-45\,T+71\,T^2-71\,T^3+58\,T^4-35\,T^5-39\,T^6+101\,T^7+37\,T^8-335\,T^9+372\,T^{10}+56\,T^{11}-506\,T^{12}+478\,T^{13}-114\,T^{14}-81\,T^{15}-31\,T^{16}+204\,T^{17}-270\,T^{18}+210\,T^{19}+8\,T^{20}-328\,T^{21}+481\,T^{22}-311\,T^{23}-7\,T^{24}+169\,T^{25}-115\,T^{26}-10\,T^{27}+59\,T^{28}-31\,T^{29}+T^{30}+3\,T^{31}\big)\Big)\Big/$$
$$\Big(2\,\left(-1+2\,T-T^2-T^3+2\,T^4-T^5+T^8\right)^2\left(-1+T^3-2\,T^4+T^5+T^6-2\,T^7+T^8\right)^2\Big)\Big)\Big\}\Big\}$$

In[∘]:=
```
ZF[K][[3, 2]] // Factor
```

Out[∘]=
$$-\frac{(-1+T)^2\left(-5+17\,T-19\,T^2+21\,T^3-19\,T^4+12\,T^5-7\,T^6+3\,T^7-T^8-T^9+T^{10}\right)}{2\left(1-3\,T+3\,T^2-3\,T^3+3\,T^4-3\,T^5+T^6\right)^2}$$

The Dunfield Knots

In[∘]:=
```
Ks = ReadList["C:\\drorbn\\AcademicPensieve\\People\\Dunfield\\nmd_random_knots"] /.
    i_Integer :> i + 1;
tab = {};
```

In[∘]:=
```
Do[
 AppendTo[tab, Echo@Timing@{Crossings[K], PAB1[K]}],
 {K, Ks[[{98, 144, 200, 288, 400, 576, 800, 998}]]}
]
```

»
$$\Big\{2530.13,\ \Big\{100,$$
$$\Big\{-\frac{1}{T^{29}}\big(90-4191\,T+93\,808\,T^2-1\,350\,157\,T^3+14\,094\,887\,T^4-114\,093\,181\,T^5+747\,334\,274\,T^6-4\,080\,812\,510\,T^7+18\,988\,434\,455\,T^8-76\,571\,119\,755\,T^9+271\,181\,538\,682\,T^{10}-852\,587\,915\,221\,T^{11}+2\,400\,574\,002\,517\,T^{12}-6\,097\,234\,930\,996\,T^{13}+14\,054\,039\,062\,621\,T^{14}-29\,545\,412\,051\,243\,T^{15}+56\,886\,358\,621\,438\,T^{16}-100\,661\,418\,654\,577\,T^{17}+164\,176\,135\,336\,778\,T^{18}-247\,394\,236\,438\,275\,T^{19}+345\,108\,115\,623\,752\,T^{20}-446\,366\,907\,831\,089\,T^{21}+535\,954\,571\,148\,512\,T^{22}-597\,914\,563\,591\,946\,T^{23}+620\,084\,807\,002\,653\,T^{24}-597\,914\,563\,591\,946\,T^{25}+535\,954\,571\,148\,512\,T^{26}-446\,366\,907\,831\,089\,T^{27}+345\,108\,115\,623\,752\,T^{28}-247\,394\,236\,438\,275\,T^{29}+164\,176\,135\,336\,778\,T^{30}-100\,661\,418\,654\,577\,T^{31}+56\,886\,358\,621\,438\,T^{32}-29\,545\,412\,051\,243\,T^{33}+14\,054\,039\,062\,621\,T^{34}-6\,097\,234\,930\,996\,T^{35}+2\,400\,574\,002\,517\,T^{36}-852\,587\,915\,221\,T^{37}+271\,181\,538\,682\,T^{38}-76\,571\,119\,755\,T^{39}+18\,988\,434\,455\,T^{40}-4\,080\,812\,510\,T^{41}+747\,334\,274\,T^{42}-114\,093\,181\,T^{43}+14\,094\,887\,T^{44}-1\,350\,157\,T^{45}+93\,808\,T^{46}-4191\,T^{47}+90\,T^{48}\big),$$
$$-\Big(\Big((-1+T)\,\big(161\,937-14\,489\,697\,T+635\,470\,366\,T^2-18\,224\,912\,736\,T^3+384\,751\,566\,717\,T^4-6\,381\,329\,305\,196\,T^5+86\,658\,799\,856\,073\,T^6-991\,584\,058\,562\,206\,T^7+9\,763\,623\,993\,034\,797\,T^8-84\,076\,719\,803\,317\,845\,T^9+641\,331\,937\,048\,382\,570\,T^{10}-4\,378\,714\,116\,477\,072\,665\,T^{11}+26\,990\,183\,066\,997\,846\,721\,T^{12}-151\,288\,917\,889\,407\,398\,042\,T^{13}+775\,948\,734\,581\,632\,316\,171\,T^{14}-3\,660\,958\,964\,786\,586\,817\,214\,T^{15}+15\,962\,504\,472\,342\,421\,264\,591\,T^{16}-$$

64 581 562 505 843 096 832 630 T^{17} + 243 311 303 073 491 331 147 690 T^{18} −
856 298 735 311 688 227 315 617 T^{19} + 2 822 944 900 929 858 644 369 579 T^{20} −
8 738 933 240 961 515 160 113 807 T^{21} + 25 458 472 578 712 325 298 194 713 T^{22} −
69 927 480 678 229 720 074 546 709 T^{23} + 181 393 191 737 996 065 840 241 005 T^{24} −
445 004 501 124 097 003 343 980 655 T^{25} + 1 033 687 547 804 490 674 841 993 843 T^{26} −
2 275 638 760 714 515 328 724 431 578 T^{27} + 4 751 215 882 377 130 946 588 810 265 T^{28} −
9 411 759 137 873 155 177 501 108 973 T^{29} + 17 690 413 774 787 798 115 426 905 408 T^{30} −
31 540 640 658 994 576 969 820 947 507 T^{31} + 53 297 774 991 732 071 532 763 788 288 T^{32} −
85 228 931 688 550 281 340 754 025 266 T^{33} + 128 643 430 474 242 418 821 299 819 784 T^{34} −
182 510 390 173 218 201 722 674 141 603 T^{35} + 241 692 056 317 095 349 595 829 558 014 T^{36} −
295 139 508 320 724 786 217 820 564 056 T^{37} + 324 652 514 925 869 741 183 188 139 946 T^{38} −
304 970 386 183 389 815 369 953 135 305 T^{39} + 205 908 118 850 260 564 978 608 921 629 T^{40} +
3 111 296 363 236 582 016 749 914 220 T^{41} − 346 445 927 479 627 754 684 974 283 714 T^{42} +
834 688 634 412 288 604 405 440 669 032 T^{43} − 1 458 036 319 728 177 457 743 419 778 867 T^{44} +
2 182 694 982 051 638 168 210 509 497 865 T^{45} − 2 952 042 342 744 579 606 055 401 216 165 T^{46} +
3 693 192 050 304 112 621 895 307 438 394 T^{47} − 4 328 109 509 722 794 343 051 266 761 846 T^{48} +
4 786 994 985 645 458 096 351 326 472 175 T^{49} − 5 020 793 020 366 755 035 184 891 794 011 T^{50} +
5 009 757 133 797 861 253 225 473 087 549 T^{51} − 4 766 017 410 577 239 294 326 975 806 422 T^{52} +
4 329 737 438 286 705 546 434 961 013 184 T^{53} − 3 760 152 865 604 486 289 348 313 265 500 T^{54} +
3 123 998 942 958 285 558 648 649 766 665 T^{55} − 2 484 211 158 559 596 215 518 900 573 521 T^{56} +
1 891 298 106 059 121 520 023 724 089 618 T^{57} − 1 378 712 368 871 726 732 876 785 780 930 T^{58} +
962 311 580 051 384 165 713 802 040 484 T^{59} − 643 009 936 356 086 296 676 113 845 755 T^{60} +
411 208 213 719 583 518 147 134 263 216 T^{61} − 251 584 683 826 167 492 104 708 726 268 T^{62} +
147 189 601 979 033 287 114 911 833 038 T^{63} − 82 298 070 694 640 478 695 458 933 887 T^{64} +
43 946 841 902 946 919 477 151 860 588 T^{65} − 22 395 101 858 544 642 180 210 433 369 T^{66} +
10 881 329 424 866 760 216 903 130 393 T^{67} − 5 035 963 769 939 453 318 787 755 944 T^{68} +
2 217 542 959 413 733 029 181 185 125 T^{69} − 927 924 083 674 023 783 962 705 545 T^{70} +
368 473 591 934 363 027 376 623 299 T^{71} − 138 640 837 664 478 618 045 728 355 T^{72} +
49 343 776 534 316 885 458 584 123 T^{73} − 16 581 192 520 385 668 596 633 351 T^{74} +
5 249 740 939 920 637 915 475 339 T^{75} − 1 562 409 291 592 034 520 485 153 T^{76} +
435 982 046 533 138 467 699 578 T^{77} − 113 739 331 804 439 621 384 632 T^{78} +
27 651 681 050 098 967 164 281 T^{79} − 6 242 026 725 801 012 912 858 T^{80} +
1 302 985 317 994 102 213 019 T^{81} − 250 340 732 276 155 283 792 T^{82} + 44 032 066 819 503 708 075 T^{83} −
» 7 046 110 397 113 115 619 T^{84} + 1 018 371 244 710 728 880 T^{85} − 131 789 112 247 948 931 T^{86} +
15 112 386 951 651 427 T^{87} − 1 515 941 369 275 850 T^{88} + 130 881 964 482 633 T^{89} − 9 522 283 529 224 T^{90} +
567 255 957 281 T^{91} − 26 545 169 178 T^{92} + 914 158 940 T^{93} − 20 577 363 T^{94} + 226 863 T^{95})) /
(2 (90 − 4191 T + 93 808 T^{2} − 1 350 157 T^{3} + 14 094 887 T^{4} − 114 093 181 T^{5} + 747 334 274 T^{6} −
4 080 812 510 T^{7} + 18 988 434 455 T^{8} − 76 571 119 755 T^{9} + 271 181 538 682 T^{10} −
852 587 915 221 T^{11} + 2 400 574 002 517 T^{12} − 6 097 234 930 996 T^{13} + 14 054 039 062 621 T^{14} −
29 545 412 051 243 T^{15} + 56 886 358 621 438 T^{16} − 100 661 418 654 577 T^{17} + 164 176 135 336 778 T^{18} −
247 394 236 438 275 T^{19} + 345 108 115 623 752 T^{20} − 446 366 907 831 089 T^{21} + 535 954 571 148 512 T^{22} −
597 914 563 591 946 T^{23} + 620 084 807 002 653 T^{24} − 597 914 563 591 946 T^{25} + 535 954 571 148 512 T^{26} −
446 366 907 831 089 T^{27} + 345 108 115 623 752 T^{28} − 247 394 236 438 275 T^{29} +
164 176 135 336 778 T^{30} − 100 661 418 654 577 T^{31} + 56 886 358 621 438 T^{32} − 29 545 412 051 243 T^{33} +
14 054 039 062 621 T^{34} − 6 097 234 930 996 T^{35} + 2 400 574 002 517 T^{36} − 852 587 915 221 T^{37} +
271 181 538 682 T^{38} − 76 571 119 755 T^{39} + 18 988 434 455 T^{40} − 4 080 812 510 T^{41} + 747 334 274 T^{42} −
114 093 181 T^{43} + 14 094 887 T^{44} − 1 350 157 T^{45} + 93 808 T^{46} − 4191 T^{47} + 90 T^{48})^{2}))}}}

» {20 194.3, {146,

{$-\frac{1}{T^{24}}$ (4608 − 226 560 T + 5 367 456 T^{2} − 82 195 664 T^{3} + 919 380 688 T^{4} − 8 038 473 748 T^{5} + 57 373 789 206 T^{6} −

$344\,516\,034\,368\,T^{7} + 1\,779\,504\,363\,078\,T^{8} - 8\,042\,174\,372\,557\,T^{9} + 32\,231\,562\,387\,870\,T^{10} -$
$115\,815\,717\,852\,178\,T^{11} + 376\,496\,389\,523\,755\,T^{12} - 1\,115\,760\,699\,354\,364\,T^{13} + 3\,034\,085\,808\,198\,831\,T^{14} -$
$7\,613\,448\,663\,622\,029\,T^{15} + 17\,716\,466\,439\,842\,235\,T^{16} - 38\,398\,262\,636\,324\,625\,T^{17} +$
$77\,817\,245\,375\,284\,936\,T^{18} - 147\,975\,161\,806\,008\,018\,T^{19} + 264\,864\,463\,654\,413\,778\,T^{20} -$
$447\,537\,155\,866\,622\,680\,T^{21} + 715\,724\,452\,091\,768\,365\,T^{22} - 1\,085\,975\,248\,590\,733\,307\,T^{23} +$
$1\,566\,793\,410\,493\,137\,029\,T^{24} - 2\,153\,782\,249\,322\,555\,994\,T^{25} + 2\,826\,132\,464\,730\,846\,217\,T^{26} -$
$3\,545\,734\,448\,752\,219\,235\,T^{27} + 4\,259\,704\,526\,510\,564\,908\,T^{28} - 4\,906\,306\,554\,934\,041\,288\,T^{29} +$
$5\,423\,374\,081\,718\,704\,899\,T^{30} - 5\,757\,666\,735\,070\,210\,053\,T^{31} + 5\,873\,314\,948\,586\,537\,617\,T^{32} -$
$5\,757\,666\,735\,070\,210\,053\,T^{33} + 5\,423\,374\,081\,718\,704\,899\,T^{34} - 4\,906\,306\,554\,934\,041\,288\,T^{35} +$
$4\,259\,704\,526\,510\,564\,908\,T^{36} - 3\,545\,734\,448\,752\,219\,235\,T^{37} + 2\,826\,132\,464\,730\,846\,217\,T^{38} -$
$2\,153\,782\,249\,322\,555\,994\,T^{39} + 1\,566\,793\,410\,493\,137\,029\,T^{40} - 1\,085\,975\,248\,590\,733\,307\,T^{41} +$
$715\,724\,452\,091\,768\,365\,T^{42} - 447\,537\,155\,866\,622\,680\,T^{43} + 264\,864\,463\,654\,413\,778\,T^{44} -$
$147\,975\,161\,806\,008\,018\,T^{45} + 77\,817\,245\,375\,284\,936\,T^{46} - 38\,398\,262\,636\,324\,625\,T^{47} +$
$17\,716\,466\,439\,842\,235\,T^{48} - 7\,613\,448\,663\,622\,029\,T^{49} + 3\,034\,085\,808\,198\,831\,T^{50} -$
$1\,115\,760\,699\,354\,364\,T^{51} + 376\,496\,389\,523\,755\,T^{52} - 115\,815\,717\,852\,178\,T^{53} + 32\,231\,562\,387\,870\,T^{54} -$
$8\,042\,174\,372\,557\,T^{55} + 1\,779\,504\,363\,078\,T^{56} - 344\,516\,034\,368\,T^{57} + 57\,373\,789\,206\,T^{58} -$
$8\,038\,473\,748\,T^{59} + 919\,380\,688\,T^{60} - 82\,195\,664\,T^{61} + 5\,367\,456\,T^{62} - 226\,560\,T^{63} + 4608\,T^{64}\Big),$

$-\Big(\Big(\big(-1 + T\big)\,\Big(764\,116\,992 - 73\,158\,623\,232\,T + 3\,439\,280\,900\,096\,T^{2} - 105\,991\,199\,410\,176\,T^{3} +$
$2\,411\,758\,420\,522\,240\,T^{4} - 43\,265\,721\,625\,530\,112\,T^{5} + 638\,020\,949\,170\,066\,816\,T^{6} -$
$7\,961\,634\,561\,647\,453\,888\,T^{7} + 85\,885\,853\,452\,477\,144\,416\,T^{8} - 814\,175\,390\,523\,043\,043\,968\,T^{9} +$
$6\,871\,322\,681\,183\,645\,652\,800\,T^{10} - 52\,177\,107\,908\,117\,352\,155\,636\,T^{11} +$
$359\,619\,478\,550\,238\,576\,942\,049\,T^{12} - 2\,266\,403\,065\,259\,697\,821\,736\,183\,T^{13} +$
$13\,143\,201\,306\,546\,058\,953\,530\,311\,T^{14} - 70\,518\,330\,807\,768\,102\,869\,671\,279\,T^{15} +$
$351\,726\,387\,216\,396\,014\,463\,630\,626\,T^{16} - 1\,637\,674\,357\,805\,841\,857\,337\,754\,976\,T^{17} +$
$7\,144\,660\,870\,479\,205\,736\,629\,643\,564\,T^{18} - 29\,302\,592\,549\,386\,833\,488\,535\,105\,218\,T^{19} +$
$113\,316\,469\,918\,038\,034\,696\,584\,187\,421\,T^{20} - 414\,294\,640\,780\,190\,366\,123\,183\,273\,704\,T^{21} +$
$1\,435\,533\,832\,704\,614\,312\,670\,331\,372\,551\,T^{22} - 4\,724\,654\,254\,260\,323\,651\,567\,396\,492\,752\,T^{23} +$
$14\,800\,000\,214\,419\,554\,474\,111\,197\,032\,505\,T^{24} - 44\,207\,810\,510\,136\,684\,455\,610\,766\,427\,656\,T^{25} +$
$126\,132\,986\,368\,977\,801\,895\,667\,107\,693\,376\,T^{26} - 344\,303\,096\,798\,453\,368\,787\,237\,567\,797\,767\,T^{27} +$
$900\,482\,772\,131\,236\,131\,952\,212\,976\,513\,452\,T^{28} - 2\,259\,573\,209\,825\,075\,815\,100\,401\,976\,543\,734\,T^{29} +$
$5\,446\,874\,397\,323\,839\,791\,291\,117\,262\,648\,609\,T^{30} - 12\,628\,581\,960\,100\,582\,170\,440\,155\,599\,028\,804\,T^{31} +$
$28\,192\,311\,853\,538\,182\,576\,778\,400\,985\,589\,738\,T^{32} - 60\,663\,485\,819\,361\,596\,786\,806\,702\,208\,311\,878\,T^{33} +$
$125\,941\,203\,343\,849\,771\,021\,221\,802\,806\,059\,823\,T^{34} - 252\,492\,805\,759\,717\,905\,588\,003\,591\,595\,421\,685$
$T^{35} + 489\,263\,930\,345\,678\,982\,510\,564\,678\,718\,329\,440\,T^{36} -$
$917\,064\,100\,815\,211\,332\,774\,194\,481\,298\,736\,932\,T^{37} + 1\,663\,971\,843\,658\,686\,665\,960\,740\,212\,328\,386\,843$
$T^{38} - 2\,924\,749\,963\,944\,237\,154\,463\,125\,983\,005\,660\,912\,T^{39} +$
$4\,983\,273\,380\,191\,933\,723\,159\,515\,120\,306\,278\,817\,T^{40} -$
$8\,235\,522\,367\,538\,426\,167\,006\,116\,523\,796\,628\,747\,T^{41} +$
$13\,208\,887\,241\,278\,837\,769\,140\,976\,097\,887\,051\,079\,T^{42} -$
$20\,571\,650\,797\,712\,592\,739\,587\,918\,062\,152\,374\,105\,T^{43} +$
$31\,125\,041\,835\,670\,930\,074\,999\,605\,468\,452\,296\,875\,T^{44} -$
$45\,769\,815\,968\,979\,965\,730\,315\,734\,592\,525\,102\,595\,T^{45} +$
$65\,440\,575\,702\,872\,917\,402\,885\,102\,910\,814\,276\,276\,T^{46} -$
$91\,004\,484\,120\,189\,189\,288\,980\,845\,021\,373\,306\,390\,T^{47} +$
$123\,126\,761\,462\,996\,010\,695\,479\,232\,529\,009\,984\,922\,T^{48} -$
$162\,112\,905\,290\,510\,654\,438\,748\,617\,555\,190\,192\,045\,T^{49} +$
$207\,745\,798\,094\,379\,488\,167\,751\,158\,877\,993\,571\,866\,T^{50} -$
$259\,143\,036\,747\,137\,093\,285\,885\,386\,059\,471\,228\,890\,T^{51} +$
$314\,663\,924\,285\,883\,371\,314\,907\,970\,392\,176\,392\,225\,T^{52} -$
$371\,894\,772\,654\,987\,620\,980\,216\,616\,753\,273\,115\,529\,T^{53} +$

427 734 359 759 097 085 053 853 449 580 209 899 315 T^{54} −
478 588 637 562 574 620 611 136 723 322 577 116 387 T^{55} +
520 666 601 483 684 890 928 657 528 553 540 406 471 T^{56} −
550 350 434 078 828 411 199 860 827 794 771 572 429 T^{57} +
564 596 307 436 346 759 388 723 201 712 038 047 201 T^{58} −
561 311 322 469 355 376 165 167 102 169 814 629 937 T^{59} +
539 649 908 594 740 617 615 141 235 433 960 932 974 T^{60} −
500 180 920 532 088 669 110 059 618 702 117 086 205 T^{61} +
444 893 900 367 003 198 292 403 501 606 159 356 997 T^{62} −
377 036 735 214 183 343 538 480 076 815 001 055 931 T^{63} +
300 802 940 416 512 693 272 596 995 459 940 460 323 T^{64} −
220 910 152 748 111 847 353 795 479 550 077 303 061 T^{65} +
142 127 731 574 903 312 146 278 645 593 374 996 475 T^{66} −
68 817 691 633 539 816 162 349 546 087 100 092 394 T^{67} +
4 548 642 190 839 017 810 943 214 488 145 709 721 T^{68} +
48 171 724 844 587 793 774 225 735 898 414 936 163 T^{69} −
88 020 682 033 142 847 680 864 175 243 517 373 167 T^{70} +
114 839 126 415 003 811 665 136 702 030 830 369 361 T^{71} −
129 484 052 475 101 577 765 524 322 626 888 261 061 T^{72} +
133 589 810 658 825 308 640 635 636 994 576 950 661 T^{73} −
129 281 444 944 910 416 874 741 581 584 795 044 485 T^{74} +
118 883 803 919 548 327 518 270 635 929 249 388 073 T^{75} −
104 663 649 586 771 562 870 757 664 524 595 336 408 T^{76} +
88 630 798 639 469 792 470 809 150 215 545 565 796 T^{77} −
72 411 095 942 389 570 291 326 266 753 936 819 957 T^{78} +
57 191 335 869 719 288 258 812 368 730 018 580 046 T^{79} −
43 726 144 616 491 019 916 715 188 957 179 825 010 T^{80} +
32 390 489 687 856 182 452 346 652 704 369 725 968 T^{81} −
23 259 143 906 644 980 947 901 190 868 039 145 011 T^{82} +
16 195 567 523 201 952 862 212 505 831 699 692 459 T^{83} −
10 936 236 605 561 455 643 511 085 024 329 128 701 T^{84} +
7 161 200 229 624 581 207 002 594 961 418 140 927 T^{85} −
4 546 453 740 851 806 975 672 939 805 666 910 767 T^{86} +
2 797 732 217 103 480 699 101 471 140 873 818 713 T^{87} −
1 668 107 080 371 760 038 928 705 006 978 365 206 T^{88} + 963 227 993 117 488 149 779 064 086 479 816 889 T^{89} − 538 384 538 692 953 693 548 553 768 197 039 944 T^{90} +
291 108 716 268 884 488 943 375 243 978 546 588 T^{91} − 152 169 934 971 142 439 217 111 032 527 184 807 T^{92} + 76 841 686 294 921 286 877 410 382 305 875 553 T^{93} −
37 455 367 686 376 302 483 140 775 134 141 596 T^{94} + 17 607 833 584 753 809 866 993 089 267 195 660 T^{95} −
7 975 679 648 984 980 816 169 123 570 478 054 T^{96} + 3 477 465 262 482 453 436 363 451 042 376 763 T^{97} −
1 457 876 778 515 847 672 271 262 983 639 924 T^{98} + 586 995 936 620 020 363 271 395 909 951 710 T^{99} −
226 704 293 650 514 311 551 313 410 494 859 T^{100} + 83 869 900 028 588 285 462 278 137 584 868 T^{101} −
29 678 273 862 306 632 337 012 128 587 148 T^{102} + 10 029 280 641 193 727 701 679 935 863 457 T^{103} −
3 231 129 106 479 071 774 151 973 676 366 T^{104} + 990 563 442 718 037 167 782 112 711 189 T^{105} −
288 383 842 669 892 535 165 869 991 388 T^{106} + 79 552 658 529 585 978 038 080 737 053 T^{107} −
20 743 101 070 378 443 272 071 754 916 T^{108} + 5 098 698 532 107 329 588 362 804 682 T^{109} −
1 177 923 904 252 627 539 258 740 848 T^{110} + 254 921 181 085 040 399 293 954 626 T^{111} −
51 488 544 002 382 700 417 662 573 T^{112} + 9 665 186 209 658 960 091 438 505 T^{113} −
» 1 678 168 039 306 037 623 148 601 T^{114} + 268 049 190 944 682 816 294 623 T^{115} −
39 138 290 733 728 552 556 828 T^{116} + 5 185 401 774 321 877 851 616 T^{117} −
617 930 527 374 019 489 856 T^{118} + 65 534 318 803 258 712 480 T^{119} − 6 105 239 098 703 721 024 T^{120} +

491 464 515 937 915 008 T^{121} − 33 460 198 809 091 328 T^{122} + 1 871 419 847 408 384 T^{123} −
82 456 268 912 640 T^{124} + 2 679 881 807 872 T^{125} − 57 024 970 752 T^{126} + 594 837 504 T^{127})) /
(2 (4608 − 226 560 T + 5 367 456 T^{2} − 82 195 664 T^{3} + 919 380 688 T^{4} − 8 038 473 748 T^{5} + 57 373 789 206 T^{6} −
344 516 034 368 T^{7} + 1 779 504 363 078 T^{8} − 8 042 174 372 557 T^{9} + 32 231 562 387 870 T^{10} −
115 815 717 852 178 T^{11} + 376 496 389 523 755 T^{12} − 1 115 760 699 354 364 T^{13} + 3 034 085 808 198 831
T^{14} − 7 613 448 663 622 029 T^{15} + 17 716 466 439 842 235 T^{16} − 38 398 262 636 324 625 T^{17} +
77 817 245 375 284 936 T^{18} − 147 975 161 806 008 018 T^{19} + 264 864 463 654 413 778 T^{20} −
447 537 155 866 622 680 T^{21} + 715 724 452 091 768 365 T^{22} − 1 085 975 248 590 733 307 T^{23} +
1 566 793 410 493 137 029 T^{24} − 2 153 782 249 322 555 994 T^{25} + 2 826 132 464 730 846 217 T^{26} −
3 545 734 448 752 219 235 T^{27} + 4 259 704 526 510 564 908 T^{28} − 4 906 306 554 934 041 288 T^{29} +
5 423 374 081 718 704 899 T^{30} − 5 757 666 735 070 210 053 T^{31} + 5 873 314 948 586 537 617 T^{32} −
5 757 666 735 070 210 053 T^{33} + 5 423 374 081 718 704 899 T^{34} − 4 906 306 554 934 041 288 T^{35} +
4 259 704 526 510 564 908 T^{36} − 3 545 734 448 752 219 235 T^{37} + 2 826 132 464 730 846 217 T^{38} −
2 153 782 249 322 555 994 T^{39} + 1 566 793 410 493 137 029 T^{40} − 1 085 975 248 590 733 307 T^{41} +
715 724 452 091 768 365 T^{42} − 447 537 155 866 622 680 T^{43} + 264 864 463 654 413 778 T^{44} −
147 975 161 806 008 018 T^{45} + 77 817 245 375 284 936 T^{46} − 38 398 262 636 324 625 T^{47} +
17 716 466 439 842 235 T^{48} − 7 613 448 663 622 029 T^{49} + 3 034 085 808 198 831 T^{50} −
1 115 760 699 354 364 T^{51} + 376 496 389 523 755 T^{52} − 115 815 717 852 178 T^{53} + 32 231 562 387 870
T^{54} − 8 042 174 372 557 T^{55} + 1 779 504 363 078 T^{56} − 344 516 034 368 T^{57} + 57 373 789 206 T^{58} −
8 038 473 748 T^{59} + 919 380 688 T^{60} − 82 195 664 T^{61} + 5 367 456 T^{62} − 226 560 T^{63} + 4608 T^{64} $)^{2}$)) } } }

» {47 523.2, {202,

{$-\frac{1}{T^{62}}$ (4800 − 308 320 T + 9 808 032 T^{2} − 206 446 584 T^{3} + 3 240 074 008 T^{4} − 40 497 584 374 T^{5} + 420 342 156 836
T^{6} − 3 729 360 372 285 T^{7} + 28 886 460 771 468 T^{8} − 198 493 122 075 857 T^{9} + 1 225 259 574 313 104 T^{10} −
6 862 621 358 717 871 T^{11} + 35 161 777 425 089 269 T^{12} − 165 919 824 943 691 051 T^{13} +
725 151 525 523 471 344 T^{14} − 2 949 509 046 039 533 312 T^{15} + 11 211 306 256 912 870 636 T^{16} −
39 967 653 669 292 309 438 T^{17} + 134 053 197 568 094 483 321 T^{18} − 424 205 145 842 882 102 739 T^{19} +
1 269 667 339 152 811 019 616 T^{20} − 3 602 437 237 953 283 642 154 T^{21} + 9 709 162 260 153 481 775 468 T^{22} −
24 903 210 081 100 111 755 078 T^{23} + 60 892 070 619 759 266 748 729 T^{24} −
142 162 508 609 466 554 569 870 T^{25} + 317 370 541 942 009 804 323 618 T^{26} −
678 424 052 396 014 040 801 259 T^{27} + 1 390 425 932 872 917 374 248 443 T^{28} −
2 735 476 394 145 142 161 400 403 T^{29} + 5 171 952 055 961 873 577 218 673 T^{30} −
9 407 733 385 388 457 266 951 989 T^{31} + 16 480 655 049 183 131 814 166 657 T^{32} −
27 832 517 078 630 143 339 405 034 T^{33} + 45 355 511 337 845 824 737 431 258 T^{34} −
71 384 032 621 621 999 512 690 626 T^{35} + 108 603 350 274 522 125 432 833 887 T^{36} −
159 852 220 077 767 515 160 259 085 T^{37} + 227 810 788 203 271 578 088 595 570 T^{38} −
314 587 480 356 289 981 678 538 895 T^{39} + 421 245 626 639 574 905 673 378 673 T^{40} −
547 336 490 029 846 034 651 443 955 T^{41} + 690 523 005 477 615 544 197 880 341 T^{42} −
846 381 427 143 857 246 661 703 154 T^{43} + 1 008 452 514 745 427 709 634 112 880 T^{44} −
1 168 580 428 400 909 213 992 280 313 T^{45} + 1 317 531 316 281 517 546 141 592 855 T^{46} −
1 445 833 434 997 087 861 671 838 638 T^{47} + 1 544 736 819 332 921 675 652 646 352 T^{48} −
1 607 162 329 928 754 027 810 599 785 T^{49} + 1 628 503 554 237 935 640 660 012 461 T^{50} −
1 607 162 329 928 754 027 810 599 785 T^{51} + 1 544 736 819 332 921 675 652 646 352 T^{52} −
1 445 833 434 997 087 861 671 838 638 T^{53} + 1 317 531 316 281 517 546 141 592 855 T^{54} −
1 168 580 428 400 909 213 992 280 313 T^{55} + 1 008 452 514 745 427 709 634 112 880 T^{56} −
846 381 427 143 857 246 661 703 154 T^{57} + 690 523 005 477 615 544 197 880 341 T^{58} −
547 336 490 029 846 034 651 443 955 T^{59} + 421 245 626 639 574 905 673 378 673 T^{60} −
314 587 480 356 289 981 678 538 895 T^{61} + 227 810 788 203 271 578 088 595 570 T^{62} −
159 852 220 077 767 515 160 259 085 T^{63} + 108 603 350 274 522 125 432 833 887 T^{64} −

$71 384 032 621 621 999 512 690 626 T^{65} + 45 355 511 337 845 824 737 431 258 T^{66} -$
$27 832 517 078 630 143 339 405 034 T^{67} + 16 480 655 049 183 131 814 166 657 T^{68} -$
$9 407 733 385 388 457 266 951 989 T^{69} + 5 171 952 055 961 873 577 218 673 T^{70} -$
$2 735 476 394 145 142 161 400 403 T^{71} + 1 390 425 932 872 917 374 248 443 T^{72} -$
$678 424 052 396 014 040 801 259 T^{73} + 317 370 541 942 009 804 323 618 T^{74} -$
$142 162 508 609 466 554 569 870 T^{75} + 60 892 070 619 759 266 748 729 T^{76} -$
$24 903 210 081 100 111 755 078 T^{77} + 9 709 162 260 153 481 775 468 T^{78} - 3 602 437 237 953 283 642 154 T^{79} +$
$1 269 667 339 152 811 019 616 T^{80} - 424 205 145 842 882 102 739 T^{81} + 134 053 197 568 094 483 321 T^{82} -$
$39 967 653 669 292 309 438 T^{83} + 11 211 306 256 912 870 636 T^{84} - 2 949 509 046 039 533 312 T^{85} +$
$725 151 525 523 471 344 T^{86} - 165 919 824 943 691 051 T^{87} + 35 161 777 425 089 269 T^{88} -$
$6 862 621 358 717 871 T^{89} + 1 225 259 574 313 104 T^{90} - 198 493 122 075 857 T^{91} +$
$28 886 460 771 468 T^{92} - 3 729 360 372 285 T^{93} + 420 342 156 836 T^{94} - 40 497 584 374 T^{95} +$
$3 240 074 008 T^{96} - 206 446 584 T^{97} + 9 808 032 T^{98} - 308 320 T^{99} + 4800 T^{100}),$

$-(((-1 + T) (987 099 136 - 124 379 138 048 T + 7 798 546 122 496 T^2 - 324 576 957 954 304 T^3 +$
$10 092 819 466 715 392 T^4 - 250 212 078 578 000 768 T^5 + 5 153 437 321 659 901 360 T^6 -$
$90 731 666 901 446 584 816 T^7 + 1 394 369 096 884 600 439 280 T^8 - 19 006 665 626 124 478 509 416 T^9 +$
$232 721 325 714 933 548 898 953 T^{10} - 2 585 929 106 098 833 051 163 333 T^{11} +$
$26 297 905 814 520 775 242 008 033 T^{12} - 246 509 413 122 988 105 101 999 725 T^{13} +$
$2 142 775 257 798 340 491 544 339 145 T^{14} - 17 362 282 496 846 522 459 440 283 017 T^{15} +$
$131 729 690 298 890 186 676 193 687 686 T^{16} - 939 557 153 448 157 781 332 831 979 194 T^{17} +$
$6 321 775 572 725 439 050 980 470 716 739 T^{18} - 40 250 845 588 079 899 395 955 459 740 056 T^{19} +$
» $243 181 598 940 839 296 885 938 258 944 898 T^{20} - 1 397 599 767 245 485 336 675 035 767 211 411 T^{21} +$
$7 657 765 640 390 344 990 439 804 130 027 443 T^{22} - 40 083 668 510 523 030 111 333 915 378 260 914 T^{23} +$
$200 806 642 959 102 754 482 191 371 374 018 046 T^{24} -$
$964 412 910 184 772 574 615 278 515 245 835 808 T^{25} + 4 447 232 266 784 147 678 346 723 842 571 130 414$
$T^{26} - 19 718 396 176 154 942 873 091 270 239 997 483 091 T^{27} +$
$84 173 075 260 206 492 366 265 998 946 906 879 346 T^{28} -$
$346 351 039 118 067 715 052 167 693 438 502 466 247 T^{29} +$
$1 375 260 402 919 825 750 597 001 605 623 683 857 625 T^{30} -$
$5 275 061 561 015 294 856 990 577 317 710 841 553 682 T^{31} +$
$19 564 209 438 811 526 882 740 157 782 218 379 441 501 T^{32} -$
$70 222 992 576 318 949 624 133 321 829 528 771 089 516 T^{33} +$
$244 142 516 984 154 581 384 619 110 585 517 547 151 262 T^{34} -$
$822 804 032 928 775 734 993 116 306 030 848 552 529 132 T^{35} +$
$2 690 043 472 303 690 344 091 498 150 756 971 740 125 534 T^{36} -$
$8 537 564 955 427 363 336 498 728 216 622 770 040 222 252 T^{37} +$
$26 321 164 967 002 177 499 930 978 815 605 585 085 345 486 T^{38} -$
$78 875 316 518 765 021 754 371 964 792 236 600 430 773 028 T^{39} +$
$229 877 211 030 737 739 118 437 440 252 986 474 119 443 122 T^{40} -$
$651 943 350 828 790 658 065 704 655 079 645 898 818 625 414 T^{41} +$
$1 800 158 597 480 666 746 436 409 430 864 479 646 507 847 235 T^{42} -$
$4 841 889 637 440 309 873 517 125 762 285 143 727 603 405 376 T^{43} +$
$12 691 930 474 675 474 013 390 055 251 839 167 437 517 496 277 T^{44} -$
$32 437 293 022 586 172 636 232 325 374 594 813 595 856 494 846 T^{45} +$
$80 863 347 090 650 042 434 996 417 496 581 613 710 914 697 203 T^{46} -$
$196 709 937 676 505 270 088 886 112 814 117 526 196 753 422 743 T^{47} +$
$467 129 613 694 294 203 617 697 137 119 263 137 530 462 477 742 T^{48} -$
$1 083 293 820 256 849 989 118 768 039 289 300 245 423 140 346 802 T^{49} +$
$2 454 182 123 424 701 438 050 835 920 683 340 522 427 183 170 020 T^{50} -$
$5 433 327 302 576 867 194 986 872 705 163 986 230 005 563 749 009 T^{51} +$

11 758 819 828 778 507 154 116 542 672 453 251 244 187 668 337 675 T^{52} −
24 884 804 935 728 874 665 033 426 151 844 219 023 552 375 908 252 T^{53} +
51 511 605 254 833 799 439 417 008 528 690 375 063 800 671 496 038 T^{54} −
104 327 313 132 641 424 050 697 174 242 401 021 031 615 236 744 976 T^{55} +
206 789 759 448 816 890 332 971 193 763 435 170 328 008 813 465 925 T^{56} −
401 243 865 059 427 019 776 751 272 119 484 240 100 458 886 320 995 T^{57} +
762 326 242 477 791 319 768 261 992 601 637 942 863 705 046 614 304 T^{58} −
1 418 487 733 172 648 020 680 417 455 187 083 651 684 615 144 830 503 T^{59} +
2 585 569 053 690 001 638 155 352 281 022 952 621 627 227 117 716 895 T^{60} −
4 617 644 579 864 512 570 701 770 101 773 184 161 046 460 978 122 180 T^{61} +
8 081 665 630 085 471 653 088 653 927 224 191 337 355 649 323 004 703 T^{62} −
13 863 520 950 635 119 415 181 896 543 955 289 732 219 890 385 335 840 T^{63} +
23 313 559 078 092 624 211 890 151 915 995 446 062 701 226 861 828 572 T^{64} −
38 438 774 139 302 814 176 663 660 628 547 122 805 805 708 057 582 414 T^{65} +
62 145 968 043 472 649 703 628 882 340 344 804 744 351 081 418 530 406 T^{66} −
98 534 400 245 575 362 067 349 193 418 447 091 776 921 090 249 269 001 T^{67} +
153 226 908 006 894 300 820 851 840 729 717 984 404 413 016 732 217 502 T^{68} −
233 714 696 222 997 090 137 957 997 351 009 384 232 596 311 621 179 544 T^{69} +
349 673 015 071 829 248 473 661 920 406 052 250 094 651 069 118 155 367 T^{70} −
513 183 753 576 802 654 378 760 326 864 098 686 326 599 704 532 686 023 T^{71} +
738 778 805 466 783 888 642 912 730 220 597 974 478 020 057 612 342 368 T^{72} −
» 1 043 198 562 619 327 376 194 104 244 304 945 337 199 362 672 739 123 621 T^{73} +
1 444 748 081 034 523 328 621 298 266 384 436 145 260 349 471 731 742 722 T^{74} −
1 962 135 329 157 390 708 998 706 793 377 647 568 734 675 314 646 129 361 T^{75} +
2 612 697 600 110 213 550 698 206 765 115 412 081 339 672 914 974 856 273 T^{76} −
3 409 968 707 174 929 985 015 538 443 968 787 546 843 729 546 253 577 798 T^{77} +
4 360 613 468 354 192 993 318 927 857 858 124 896 772 385 065 667 382 650 T^{78} −
5 460 855 577 227 263 424 995 605 535 558 339 581 605 037 108 922 139 151 T^{79} +
6 692 643 229 235 292 907 420 058 466 140 270 878 022 547 826 969 630 695 T^{80} −
8 019 920 856 693 127 127 638 569 878 007 034 236 635 420 669 794 554 277 T^{81} +
9 385 486 602 181 526 686 799 349 767 337 886 346 204 690 885 023 609 172 T^{82} −
10 708 991 637 314 478 275 004 878 294 351 873 396 534 045 028 518 845 377 T^{83} +
11 886 656 421 522 793 463 325 133 987 039 810 480 856 252 958 230 990 109 T^{84} −
12 793 221 271 544 870 445 095 555 217 162 219 606 697 287 431 114 672 505 T^{85} +
13 286 502 887 998 012 392 698 257 695 979 033 990 365 659 933 804 826 868 T^{86} −
13 214 695 425 642 258 746 787 850 407 988 157 318 495 714 120 442 807 100 T^{87} +
12 426 249 556 467 427 521 997 019 873 525 516 916 063 206 786 080 700 570 T^{88} −
10 781 816 028 891 983 390 721 792 673 767 792 126 152 645 089 909 405 034 T^{89} +
8 167 394 423 883 992 112 400 553 325 884 201 159 902 106 064 003 053 596 T^{90} −
4 507 533 666 577 488 585 267 776 405 494 093 413 869 855 847 408 886 740 T^{91} −
222 760 913 263 417 681 349 211 091 346 652 936 515 676 253 684 299 602 T^{92} +
5 988 806 173 084 509 338 399 006 973 538 418 676 318 989 799 881 872 818 T^{93} −
12 690 973 956 230 022 407 685 088 311 855 101 946 730 816 832 161 899 928 T^{94} +
20 164 349 293 645 914 128 960 007 367 012 126 491 943 089 162 161 457 721 T^{95} −
28 183 836 821 886 591 433 727 153 547 852 203 814 272 941 212 201 829 677 T^{96} +
36 474 686 034 889 082 431 212 777 202 567 629 137 612 863 385 943 066 185 T^{97} −
44 727 816 162 884 429 760 815 931 511 895 308 758 520 751 163 197 314 753 T^{98} +
52 618 770 012 386 393 019 119 280 152 928 155 778 564 370 571 743 447 429 T^{99} −
59 828 687 470 167 614 568 541 545 544 625 577 056 806 411 082 801 237 077 T^{100} +
66 065 424 920 349 432 904 894 385 003 628 559 933 640 529 105 123 432 433 T^{101} −
71 082 894 988 379 578 696 004 477 671 115 045 583 161 623 342 460 086 483 T^{102} +

74 696 871 099 031 193 900 219 423 541 848 234 564 011 012 904 967 593 851 T^{103} −
76 795 871 886 024 592 388 899 614 148 206 618 657 459 403 070 449 874 459 T^{104} +
77 346 262 734 015 496 551 430 635 960 905 543 587 878 531 599 944 101 860 T^{105} −
76 391 317 208 349 427 365 589 411 917 390 456 593 856 370 584 978 961 250 T^{106} +
74 044 592 282 932 756 282 073 228 295 689 091 949 468 891 881 662 623 910 T^{107} −
70 478 513 094 555 760 031 390 433 476 987 466 788 741 266 559 757 686 432 T^{108} +
65 909 473 632 280 914 427 690 338 938 667 407 112 188 776 278 062 570 676 T^{109} −
60 580 998 760 008 417 765 186 840 700 611 892 899 451 633 773 075 766 784 T^{110} +
54 746 565 202 471 287 082 273 033 630 472 760 130 523 592 604 394 198 512 T^{111} −
48 653 555 063 599 683 179 514 089 541 490 025 477 379 460 662 323 438 570 T^{112} +
42 529 547 284 909 828 294 095 478 880 983 054 558 994 989 675 194 646 026 T^{113} −
36 571 787 439 196 652 778 237 270 350 279 406 868 993 163 906 155 924 193 T^{114} +
30 940 268 505 961 919 950 452 550 566 984 922 213 339 425 306 767 979 193 T^{115} −
25 754 457 526 145 059 971 616 229 000 668 772 111 767 149 743 142 877 145 T^{116} +
21 093 359 640 481 200 005 919 585 658 261 046 900 035 670 230 537 283 664 T^{117} −
16 998 353 116 276 124 434 265 605 947 759 738 547 843 717 393 857 213 801 T^{118} +
13 478 072 254 786 022 710 400 394 561 619 489 899 120 716 594 351 756 563 T^{119} −
10 514 560 130 785 992 627 591 816 163 128 643 722 897 979 181 398 951 971 T^{120} +
8 069 947 871 552 250 765 362 724 920 352 470 487 226 243 551 678 888 146 T^{121} −
6 093 020 735 434 785 966 276 467 856 765 714 532 779 434 975 202 071 376 T^{122} +
4 525 178 284 285 087 444 262 624 302 437 358 095 553 701 798 181 170 519 T^{123} −
3 305 460 931 798 525 795 844 932 861 527 788 607 898 998 970 602 223 927 T^{124} +
2 374 475 763 090 535 515 630 122 775 082 340 837 741 296 454 285 544 540 T^{125} −
1 677 193 889 907 119 924 064 255 337 925 307 574 116 671 673 860 417 291 T^{126} +
1 164 699 325 912 713 549 031 318 948 162 599 036 761 482 241 943 565 854 T^{127} −
795 041 368 114 039 337 882 587 522 462 564 063 176 366 433 974 786 991 T^{128} +
533 380 027 681 216 177 257 895 821 793 697 677 823 727 014 095 865 679 T^{129} −
351 622 277 893 806 979 884 527 286 645 656 223 970 907 724 475 205 810 T^{130} +
227 733 058 738 503 032 254 026 261 161 266 825 633 018 513 491 244 432 T^{131} −
144 877 004 659 004 877 536 647 785 562 909 719 136 869 315 799 493 065 T^{132} +
90 512 066 593 690 014 156 110 555 975 991 263 583 690 050 532 266 342 T^{133} −
55 520 528 175 177 652 367 543 684 072 370 297 725 818 162 475 455 562 T^{134} +
33 430 572 559 537 476 689 513 295 864 132 627 205 615 368 752 606 112 T^{135} −
19 754 992 074 670 864 150 337 258 736 050 428 104 410 613 159 130 848 T^{136} +
11 453 788 107 077 521 992 590 861 787 190 109 370 552 956 788 702 763 T^{137} −
6 514 091 113 959 471 110 593 487 537 834 552 799 977 288 846 489 676 T^{138} +
3 633 128 889 585 185 271 434 629 755 644 237 957 358 489 306 589 079 T^{139} −
1 986 628 510 370 580 744 612 785 160 938 069 507 547 353 218 657 403 T^{140} +
1 064 742 600 075 629 995 985 139 005 588 446 085 939 923 232 431 796 T^{141} −
559 170 792 190 972 236 024 128 963 882 567 895 958 611 294 120 411 T^{142} +
287 668 568 798 304 104 497 913 217 546 907 998 206 468 738 387 761 T^{143} −
144 930 879 755 625 968 215 065 757 978 982 345 781 783 363 326 862 T^{144} +
71 485 612 314 609 216 492 822 291 138 330 626 346 892 605 195 244 T^{145} −
34 508 818 603 490 084 881 830 320 444 807 936 956 753 393 913 380 T^{146} +
16 298 795 758 921 999 579 497 410 570 766 212 199 796 621 360 003 T^{147} −
7 529 230 668 780 096 196 510 202 499 368 022 104 466 475 867 841 T^{148} +
3 400 683 298 452 482 879 073 106 434 234 972 887 239 040 258 944 T^{149} −
1 501 232 500 589 812 177 851 961 305 103 461 634 054 954 111 134 T^{150} +
647 494 496 356 607 130 082 742 429 845 223 629 390 788 943 610 T^{151} −
272 750 041 612 759 308 793 434 610 228 285 582 474 464 250 133 T^{152} +
112 166 230 052 700 982 936 673 005 801 347 330 624 300 276 973 T^{153} −

45 014 154 500 323 548 776 841 595 628 762 225 388 388 582 146 T^{154} +
17 621 364 509 969 712 160 030 634 510 288 585 465 706 148 661 T^{155} −
6 725 728 178 646 870 761 893 705 606 924 573 397 869 465 638 T^{156} +
2 501 760 605 927 669 468 250 883 548 091 956 306 717 112 121 T^{157} −
906 456 395 920 315 065 964 066 144 572 352 692 015 662 142 T^{158} +
319 757 579 828 441 073 590 854 436 613 365 345 993 748 658 T^{159} −
109 757 618 722 472 023 082 790 876 863 168 251 395 152 392 T^{160} +
36 639 005 893 229 486 192 490 783 731 851 212 753 541 818 T^{161} −
11 887 491 704 451 921 274 845 074 584 273 930 301 086 950 T^{162} +
3 746 300 162 324 069 281 343 269 767 638 827 006 605 904 T^{163} −
1 146 023 569 314 117 207 137 838 572 127 018 193 230 118 T^{164} +
340 062 774 895 916 277 424 693 120 851 329 943 284 788 T^{165} −
97 808 495 210 864 797 674 958 210 072 279 094 904 150 T^{166} +
27 246 012 146 704 872 330 194 049 104 844 674 397 707 T^{167} −
7 344 675 664 292 370 021 911 435 407 512 453 357 966 T^{168} +
1 914 234 456 321 132 511 935 180 065 129 172 542 717 T^{169} −
481 894 973 661 473 811 499 225 274 424 793 586 931 T^{170} +
117 056 544 252 694 089 459 920 486 282 409 118 558 T^{171} −
27 405 779 544 368 786 071 516 758 972 335 693 645 T^{172} +
6 176 902 534 744 792 472 221 696 207 836 338 900 T^{173} −
1 338 497 835 031 886 569 768 313 007 194 721 628 T^{174} +
278 465 284 668 764 669 325 690 809 634 297 518 T^{175} − 55 534 745 493 645 998 745 723 557 438 444 710 T^{176} + 10 599 155 562 857 066 274 948 635 162 699 495 T^{177} −
1 932 382 137 045 462 443 996 676 466 931 333 T^{178} + 335 855 649 658 299 054 354 994 089 870 164 T^{179} −
55 524 042 514 471 397 353 319 173 682 642 T^{180} + 8 709 699 705 240 762 603 156 340 718 741 T^{181} −
1 292 768 329 392 160 818 818 614 004 612 T^{182} + 181 005 260 499 681 637 355 252 698 384 T^{183} −
23 823 308 173 801 591 476 066 865 465 T^{184} + 2 935 878 686 172 126 247 605 080 053 T^{185} −
337 240 899 232 109 473 309 085 507 T^{186} + 35 921 323 165 780 741 356 147 399 T^{187} −
3 526 559 175 823 790 962 692 403 T^{188} + 316 849 121 091 410 995 714 591 T^{189} −
25 833 387 148 435 632 983 800 T^{190} + 1 891 856 210 054 199 852 176 T^{191} − 122 879 144 603 897 926 928 T^{192} + 6 966 213 823 199 880 656 T^{193} − 337 564 967 346 814 848 T^{194} + 13 588 652 416 314 112 T^{195} −
436 071 838 784 256 T^{196} + 10 454 126 850 304 T^{197} − 166 344 189 952 T^{198} + 1 316 900 864 T^{199})) /
(2 (4800 − 308 320 T + 9 808 032 T^2 − 206 446 584 T^3 + 3 240 074 008 T^4 − 40 497 584 374 T^5 +
420 342 156 836 T^6 − 3 729 360 372 285 T^7 + 28 886 460 771 468 T^8 − 198 493 122 075 857 T^9 +
1 225 259 574 313 104 T^{10} − 6 862 621 358 717 871 T^{11} + 35 161 777 425 089 269 T^{12} −
165 919 824 943 691 051 T^{13} + 725 151 525 523 471 344 T^{14} − 2 949 509 046 039 533 312 T^{15} +
11 211 306 256 912 870 636 T^{16} − 39 967 653 669 292 309 438 T^{17} + 134 053 197 568 094 483 321 T^{18} −
424 205 145 842 882 102 739 T^{19} + 1 269 667 339 152 811 019 616 T^{20} − 3 602 437 237 953 283 642 154 T^{21} + 9 709 162 260 153 481 775 468 T^{22} − 24 903 210 081 100 111 755 078 T^{23} +
60 892 070 619 759 266 748 729 T^{24} − 142 162 508 609 466 554 569 870 T^{25} +
317 370 541 942 009 804 323 618 T^{26} − 678 424 052 396 014 040 801 259 T^{27} +
1 390 425 932 872 917 374 248 443 T^{28} − 2 735 476 394 145 142 161 400 403 T^{29} +
5 171 952 055 961 873 577 218 673 T^{30} − 9 407 733 385 388 457 266 951 989 T^{31} +
16 480 655 049 183 131 814 166 657 T^{32} − 27 832 517 078 630 143 339 405 034 T^{33} +
45 355 511 337 845 824 737 431 258 T^{34} − 71 384 032 621 621 999 512 690 626 T^{35} +
108 603 350 274 522 125 432 833 887 T^{36} − 159 852 220 077 767 515 160 259 085 T^{37} +
227 810 788 203 271 578 088 595 570 T^{38} − 314 587 480 356 289 981 678 538 895 T^{39} +
421 245 626 639 574 905 673 378 673 T^{40} − 547 336 490 029 846 034 651 443 955 T^{41} +
690 523 005 477 615 544 197 880 341 T^{42} − 846 381 427 143 857 246 661 703 154 T^{43} +
1 008 452 514 745 427 709 634 112 880 T^{44} − 1 168 580 428 400 909 213 992 280 313 T^{45} +

$1\,317\,531\,316\,281\,517\,546\,141\,592\,855\,T^{46} - 1\,445\,833\,434\,997\,087\,861\,671\,838\,638\,T^{47} +$
$1\,544\,736\,819\,332\,921\,675\,652\,646\,352\,T^{48} - 1\,607\,162\,329\,928\,754\,027\,810\,599\,785\,T^{49} +$
$1\,628\,503\,554\,237\,935\,640\,660\,012\,461\,T^{50} - 1\,607\,162\,329\,928\,754\,027\,810\,599\,785\,T^{51} +$
$1\,544\,736\,819\,332\,921\,675\,652\,646\,352\,T^{52} - 1\,445\,833\,434\,997\,087\,861\,671\,838\,638\,T^{53} +$
$1\,317\,531\,316\,281\,517\,546\,141\,592\,855\,T^{54} - 1\,168\,580\,428\,400\,909\,213\,992\,280\,313\,T^{55} +$
$1\,008\,452\,514\,745\,427\,709\,634\,112\,880\,T^{56} - 846\,381\,427\,143\,857\,246\,661\,703\,154\,T^{57} +$
$690\,523\,005\,477\,615\,544\,197\,880\,341\,T^{58} - 547\,336\,490\,029\,846\,034\,651\,443\,955\,T^{59} +$
$421\,245\,626\,639\,574\,905\,673\,378\,673\,T^{60} - 314\,587\,480\,356\,289\,981\,678\,538\,895\,T^{61} +$
$227\,810\,788\,203\,271\,578\,088\,595\,570\,T^{62} - 159\,852\,220\,077\,767\,515\,160\,259\,085\,T^{63} +$
$108\,603\,350\,274\,522\,125\,432\,833\,887\,T^{64} - 71\,384\,032\,621\,621\,999\,512\,690\,626\,T^{65} +$
$45\,355\,511\,337\,845\,824\,737\,431\,258\,T^{66} - 27\,832\,517\,078\,630\,143\,339\,405\,034\,T^{67} +$
$16\,480\,655\,049\,183\,131\,814\,166\,657\,T^{68} - 9\,407\,733\,385\,388\,457\,266\,951\,989\,T^{69} +$
$5\,171\,952\,055\,961\,873\,577\,218\,673\,T^{70} - 2\,735\,476\,394\,145\,142\,161\,400\,403\,T^{71} +$
$1\,390\,425\,932\,872\,917\,374\,248\,443\,T^{72} - 678\,424\,052\,396\,014\,040\,801\,259\,T^{73} +$
$317\,370\,541\,942\,009\,804\,323\,618\,T^{74} - 142\,162\,508\,609\,466\,554\,569\,870\,T^{75} +$
$60\,892\,070\,619\,759\,266\,748\,729\,T^{76} - 24\,903\,210\,081\,100\,111\,755\,078\,T^{77} +$
$9\,709\,162\,260\,153\,481\,775\,468\,T^{78} - 3\,602\,437\,237\,953\,283\,642\,154\,T^{79} +$
$1\,269\,667\,339\,152\,811\,019\,616\,T^{80} - 424\,205\,145\,842\,882\,102\,739\,T^{81} + 134\,053\,197\,568\,094\,483\,321\,T^{82} -$
$39\,967\,653\,669\,292\,309\,438\,T^{83} + 11\,211\,306\,256\,912\,870\,636\,T^{84} - 2\,949\,509\,046\,039\,533\,312\,T^{85} +$
$725\,151\,525\,523\,471\,344\,T^{86} - 165\,919\,824\,943\,691\,051\,T^{87} + 35\,161\,777\,425\,089\,269\,T^{88} -$
$6\,862\,621\,358\,717\,871\,T^{89} + 1\,225\,259\,574\,313\,104\,T^{90} - 198\,493\,122\,075\,857\,T^{91} +$
» $28\,886\,460\,771\,468\,T^{92} - 3\,729\,360\,372\,285\,T^{93} + 420\,342\,156\,836\,T^{94} - 40\,497\,584\,374\,T^{95} +$
$3\,240\,074\,008\,T^{96} - 206\,446\,584\,T^{97} + 9\,808\,032\,T^{98} - 308\,320\,T^{99} + 4800\,T^{100}\big)^2\big)\big)\big\}\big\}\big\}$

Out[ ]= $Aborted