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In[ ]:= SetDirectory["C:\\drorbn\\AcademicPensieve\\People\\Overbay"];
<< "../..../Projects/Profile/Profile.m"

This is Profile.m of http://www.drorbn.net/AcademicPensieve/Projects/Profile/.

This version: June 2018. Original version: July 1994.

In[ ]:= Clear[initialcrossing, initialmatrix, braidword, Quad, A, F, HigherOrder,
  kerbeforesub, keraftersub, exp2, poly, poly2, tr, knot, n, p1, p2, p3, p4]

In[ ]:= knot = {9, 14};
f[i_, n_] := If[n > 0, ConstantArray[{i, i + 1}, {n}], ConstantArray[{i + 1, i}, {-n}]
list = Flatten[f /@ KnotData[knot, "BraidWord"]];
initialcrossing = firstcrossing[Take[list, {1, 2}]];
initialmatrix = firstmatrix[Take[list, {1, 2}]];
braidword = Sequence[Partition[Take[list, 2 - Length[list]], 2]];
n = KnotData[knot, "BraidIndex"];
firstcrossing[{x_, y_] := If[x < y, HOx,y, INVy,x];
firstmatrix[{x_, y_] := If[x < y, Matrixx,y, Imatrixy,x];
alex = KnotData[knot, "AlexanderPolynomial"] [t^2];
amp = KnotData[knot, "Amphichiral"];
rep2[i_, j_] :=
  Which[i == j == 0, 1, True, ((i! j! Coefficient[exp2, d2^i z2^j]) /. {z2 → 0, d2 → 0})]
rep3[i_, j_, k_, L_] := Which[i == j == k == L == 0, 1, True,
  ((i! j! k! L! Coefficient[exp2, d2^i z2^j d3^k z3^L]) /. {z2 → 0, d2 → 0, z3 → 0, d3 → 0})]
rep4[i_, j_, k_, L_, m_, n_] := Which[i == j == k == L == m == n == 0, 1, True,
  ((i! j! k! L! m! n! Coefficient[exp2, d2^i z2^j d3^k z3^L d4^m z4^n]) /.
  {z2 → 0, d2 → 0, z3 → 0, d3 → 0, z4 → 0, d4 → 0})]
rep5[i_, j_, k_, L_, m_, n_, o_, p_] := PPrep5@
  Which[i == j == k == L == m == n == o == p == 0, 1, True,
  ((i! j! k! L! m! n! o! p! Coefficient[exp2, d2^i z2^j d3^k z3^L d4^m z4^n d5^o z5^p]) /.
  {z2 → 0, d2 → 0, z3 → 0, d3 → 0, z4 → 0, d4 → 0, z5 → 0, d5 → 0})]
rep6[i_, j_, k_, L_, m_, n_, o_, p_, q_, r_] := Which[
  i == j == k == L == m == n == o == p == q == r == 0, 1, True, ((i! j! k! L! m! n! o! p! q!
  r! Coefficient[exp2, d2^i z2^j d3^k z3^L d4^m z4^n d5^o z5^p d6^q z6^r]) /.
  {z2 → 0, d2 → 0, z3 → 0, d3 → 0, z4 → 0, d4 → 0, z5 → 0, d5 → 0, z6 → 0, d6 → 0})]
trace2[s_] := Expand[Plus@@(s /. Rule[{a_, b_}, c_] := rep2[a, b] c)]
trace3[s_] := Expand[Plus@@(s /. Rule[{a_, b_, e_, f_}, c_] := rep3[a, b, e, f] c)]
trace4[s_] :=
  Expand[Plus@@(s /. Rule[{a_, b_, e_, f_, g_, h_}, c_] := rep4[a, b, e, f, g, h] c)]
trace5[s_] := PPtrace5@Expand[
  Plus@@(s /. Rule[{a_, b_, e_, f_, g_, h_, i_, j_}, c_] := rep5[a, b, e, f, g, h, i, j] c)]
trace6[s_] := Expand[Plus@@(s /. Rule[{a_, b_, e_, f_, g_, h_, i_, j_, k_, L_}, c_] :=
  rep6[a, b, e, f, g, h, i, j, k, L] c)]
qh[n_] := (1 + h Coefficient[Product[1 + 2 h zi di, {i, 2, n}], h, 1])
pL_,k_[i_, j_] :=
  Which[i == k && j == L, t, i == L && j == k, t, i == j == L, 0, i == j == k, 1 - t^2, i == j, 1, True, 0];
MatrixL_,k_ := Array[pL,k, {n, n};
ImatrixL_,k_ := Inverse[MatrixL,k];
SzL_,k_[zj_] := Expand[Sum[zi ImatrixL,k[[i, j]], {i, 1, n]];
SderL_,k_[dj_] := Expand[Sum[MatrixL,k[[i, j]] di, {i, 1, n]];

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ISzL-,k [zj] := Expand[Sum[zi MatrixL,k[[i, j]], {i, 1, n}]];
ISderL-,k [dj] := Expand[Sum[ImatrixL,k[[i, j]] di, {i, 1, n}]];
Higher[a-, b-, w-, x-] :=
  1 + h ( 2 a b w x -  $\frac{2 a^2 w x}{t}$  + 2 a^2 t w x + 3 a^2 x^2 -  $\frac{a^2 x^2}{t^2}$  +  $\frac{a b x^2}{t}$  - 3 a b t x^2 - 2 a^2 t^2 x^2 )
Inv[a-, b-, w-, x-] := 1 + h ( b^2 * w^2 - t^2 b^2 * w^2 +  $\frac{a * b * w^2}{t}$  + t a * b * w^2 - 2 a * b * w * x )

HOi-,j- := Higher[zi, zj, di, dj]
INVi-,j- := Inv[zi, zj, di, dj]
Deri[f-] := f + Sum[(1/k!) D[f, {wi, k}, {xi, k}], {k, 1, 4}]
N03[L-, {i-, j-}] /; i < j :=
  (Derj[Deri[Expand[1 + h Coefficient[(L /. Flatten[Table[{zk → Szi,j[zk],
    dk → Sderi,j[dk]], {k, 1, n}]]] /. {di → wi, dj → wj}] *
    Higher[xi, xj, di, dj], h, 1]]]) /. {wi → di, wj → dj, xi → zi, xj → zj}

N03[L-, {i-, j-}] /; i > j :=
  (Derj[Deri[Expand[1 + h Coefficient[(L /. Flatten[Table[{zk → ISzj,i[zk],
    dk → ISderj,i[dk]], {k, 1, n}]]] /. {di → wi, dj → wj}] *
    Inv[xj, xi, dj, di], h, 1]]]) /. {wi → di, wj → dj, xi → zi, xj → zj}

subd = Flatten[Table[di → wi, {i, 2, n}]];
subz = Flatten[Table[zi → xi, {i, 2, n}]];

g[L-, {x-, y-}] := If[x < y, L.(Matrixx,y), L.(Imatrixy,x)]

qhend3[f-] := Expand[(f /. subd) + h (Coefficient[qh[n], h, 1] /. subz)]

Quad = Expand[Fold[g, initialmatrix, braidword]];
ai-,j- := If[i == j, Quad[[i, j]] - 1, Quad[[i, j]]];
A = Table[ai,j, {i, 2, n}, {j, 2, n}];
F = Inverse[-A];

In[ ]:= BeginProfile[]
Out[ ]:= ProfileRoot

In[ ]:= AbsoluteTiming[HigherOrder3 = Fold[N03, initialcrossing, braidword];]
Out[ ]:= {4.36782, Null}

In[ ]:= AbsoluteTiming[kerbeforesub3 = ((1 = qhend3[HigherOrder3];
  Do[1 = Deri[1], {i, 2, n, 1}];
  1) /. Flatten[Table[{xi → zi, wi → di}, {i, 2, n}]]];]
Out[ ]:= {0.820409, Null}

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In[]:= **Timing**[sub = **Flatten**[**Table**[z_k → **Expand**[**Sum**[**Quad**[[i, k]] z_i, {i, 1, n}]], {k, 1, n}]]]

Out[]:= {0.,

$$\left\{ z_1 \rightarrow -z_1 + t^2 z_1 - \frac{2 z_2}{t} + 3 t z_2 - t^3 z_2 + 3 z_3 + \frac{z_3}{t^4} - \frac{2 z_3}{t^2} - t^2 z_3 - \frac{z_4}{t} + 2 t z_4 - t^3 z_4 + 3 z_5 - \frac{z_5}{t^2} - 3 t^2 z_5 + t^4 z_5, z_2 \rightarrow \frac{z_1}{t} - 5 t z_1 + 8 t^3 z_1 - 5 t^5 z_1 + t^7 z_1 - 7 z_2 + \frac{z_2}{t^2} + 14 t^2 z_2 - 13 t^4 z_2 + 6 t^6 z_2 - t^8 z_2 - \frac{z_3}{t^5} + \frac{5 z_3}{t^3} - \frac{12 z_3}{t} + 17 t z_3 - 14 t^3 z_3 + 6 t^5 z_3 - t^7 z_3 - 5 z_4 + \frac{z_4}{t^2} + 10 t^2 z_4 - 10 t^4 z_4 + 5 t^6 z_4 - t^8 z_4 + \frac{z_5}{t^3} - \frac{6 z_5}{t} + 16 t z_5 - 20 t^3 z_5 + 15 t^5 z_5 - 6 t^7 z_5 + t^9 z_5, z_3 \rightarrow -3 z_1 + \frac{z_1}{t^2} + 5 t^2 z_1 - 4 t^4 z_1 + t^6 z_1 + \frac{z_2}{t^3} - \frac{4 z_2}{t} + 9 t z_2 - 9 t^3 z_2 + 5 t^5 z_2 - t^7 z_2 + 11 z_3 - \frac{z_3}{t^6} + \frac{4 z_3}{t^4} - \frac{8 z_3}{t^2} - 10 t^2 z_3 + 5 t^4 z_3 - t^6 z_3 + \frac{z_4}{t^3} - \frac{4 z_4}{t} + 7 t z_4 - 7 t^3 z_4 + 4 t^5 z_4 - t^7 z_4 + 11 z_5 + \frac{z_5}{t^4} - \frac{5 z_5}{t^2} - 14 t^2 z_5 + 11 t^4 z_5 - 5 t^6 z_5 + t^8 z_5, z_4 \rightarrow \frac{z_1}{t^3} - \frac{3 z_1}{t} + 3 t z_1 + 2 t^3 z_1 - 5 t^5 z_1 + 4 t^7 z_1 - t^9 z_1 + 6 z_2 + \frac{z_2}{t^4} - \frac{4 z_2}{t^2} - 8 t^4 z_2 + 9 t^6 z_2 - 5 t^8 z_2 + t^{10} z_2 - \frac{z_3}{t^7} + \frac{4 z_3}{t^5} - \frac{7 z_3}{t^3} + \frac{5 z_3}{t} + 3 t z_3 - 10 t^3 z_3 + 10 t^5 z_3 - 5 t^7 z_3 + t^9 z_3 + 6 z_4 + \frac{z_4}{t^4} - \frac{4 z_4}{t^2} - 2 t^2 z_4 - 5 t^4 z_4 + 7 t^6 z_4 - 4 t^8 z_4 + t^{10} z_4 + \frac{z_5}{t^5} - \frac{5 z_5}{t^3} + \frac{10 z_5}{t} - 7 t z_5 - 4 t^3 z_5 + 12 t^5 z_5 - 11 t^7 z_5 + 5 t^9 z_5 - t^{11} z_5, z_5 \rightarrow 2 z_1 - \frac{z_1}{t^2} - t^2 z_1 - \frac{z_2}{t^3} + \frac{3 z_2}{t} - 3 t z_2 + t^3 z_2 - 3 z_3 + \frac{z_3}{t^6} - \frac{3 z_3}{t^4} + \frac{4 z_3}{t^2} + t^2 z_3 - \frac{z_4}{t^3} + \frac{3 z_4}{t} - 2 t z_4 + t^3 z_4 - 5 z_5 - \frac{z_5}{t^4} + \frac{4 z_5}{t^2} + 3 t^2 z_5 - t^4 z_5 \right\}$$

In[]:= **AbsoluteTiming**[keraftersub = **Expand**[kerbeforesub3 /. sub];]

Out[]:= {11.672, Null}

In[]:= **Timing**[sub3 = **Simplify**[**Collect**[**Flatten**[**Table**[{z_i → z_i + **Expand**[**Sum**[F[[k, i - 1]] **Quad**[[1, k + 1]] z₁, {k, 1, n - 1}]], d_i → d_i + **Expand**[**Sum**[F[[i - 1, 1]] **Quad**[[1 + 1, 1]] d₁, {1, 1, n - 1}]], {i, 2, n}]], {z₁, z₂, z₃, z₄, z₅, d₁, d₂, d₃, d₄, d₅}]]]

Out[]:= {0.015625, {z₂ → $\frac{z_1}{t} + z_2$, d₂ → $\frac{d_1}{t} + d_2$, z₃ → $\frac{z_1}{t^2} + z_3$, d₃ → $\frac{d_1}{t^2} + d_3$, z₄ → $\frac{z_1}{t^3} + z_4$, d₄ → $\frac{d_1}{t^3} + d_4$, z₅ → $\frac{z_1}{t^4} + z_5$, d₅ → $\frac{d_1}{t^4} + d_5$ }}

In[]:= **AbsoluteTiming**[twopoly = **Expand**[keraftersub /. sub3]]

Out[]:=
$$\left\{ 0.209618, \right.$$

$$1 + \frac{2 h d_1 z_1}{t^8} + \frac{2 h d_1 z_1}{t^6} + \frac{2 h d_1 z_1}{t^4} + \frac{2 h d_1 z_1}{t^2} + \frac{2 h d_2 z_1}{t} + \frac{2 h d_3 z_1}{t^2} + \frac{2 h d_4 z_1}{t^3} + \frac{2 h d_5 z_1}{t^4} + \dots 4107 \dots + 44 h d_5^2 z_5^2 -$$

$$\left. \frac{h d_5^2 z_5^2}{t^8} + \frac{4 h d_5^2 z_5^2}{t^6} - \frac{h d_5^2 z_5^2}{t^4} - \frac{19 h d_5^2 z_5^2}{t^2} - 51 h t^2 d_5^2 z_5^2 + 36 h t^4 d_5^2 z_5^2 - 15 h t^6 d_5^2 z_5^2 + 3 h t^8 d_5^2 z_5^2 \right\}$$

large output **show less** **show more** **show all** **set size limit...**

In[]:= **Timing**[
sub4 = Sum[(**Expand**[**Sum**[**F**[[i - 1, j - 1]] d_i z_j, {j, 2, n}, {i, 2, n}]]]^i/i!, {i, 1, 4}]]

Out[]:=
$$\left\{ 0.015625, \frac{4 d_2 z_2}{2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10}} - \frac{18 t^2 d_2 z_2}{2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10}} + \frac{32 t^4 d_2 z_2}{2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10}} - \frac{26 t^6 d_2 z_2}{\dots 1 \dots} + \dots 153 \dots + \right.$$

$$\left. \frac{\dots 1 \dots}{\dots 1 \dots} + \frac{1}{2} \left(\frac{\dots 1 \dots}{\dots 1 \dots} \right)^2 + \frac{1}{6} \left(\frac{\dots 159 \dots}{\dots 1 \dots} + \frac{\dots 1 \dots}{\dots 1 \dots} \right)^3 + \frac{1}{24} \left(\frac{\dots 159 \dots}{\dots 1 \dots} + \frac{2 t^{10} d_5 z_5}{\dots 6 \dots + 2 \dots 1 \dots} \right)^4 \right\}$$

large output **show less** **show more** **show all** **set size limit...**

In[]:= **AbsoluteTiming**[exp2 = **Expand**[1 + sub4];]

Out[]:= {4.20819, Null}

In[]:= **sub5 = Flatten**[**Table**[{d_i, z_i}, {i, 2, n}]]

Out[]:= {d₂, z₂, d₃, z₃, d₄, z₄, d₅, z₅}

In[]:= **AbsoluteTiming**[poly2 = **CoefficientRules**[twopoly, sub5]]

Out[]:=
$$\left\{ 0.101604, \left\{ \{2, 2, 0, 0, 0, 0, 0, 0\} \rightarrow \right.$$

$$-32 h - \frac{2 h}{t^4} + \frac{13 h}{t^2} + 3 h t^2 + 144 h t^4 - 341 h t^6 + 408 h t^8 - 292 h t^{10} + 126 h t^{12} - 30 h t^{14} + 3 h t^{16},$$

$$\left. \dots 223 \dots, \{0, 0, 0, 0, 0, 0, 0, 0\} \rightarrow 1 + \frac{2 h d_1 z_1}{t^8} + \frac{2 h d_1 z_1}{t^6} + \frac{2 h d_1 z_1}{t^4} + \frac{2 h d_1 z_1}{t^2} \right\}$$

large output **show less** **show more** **show all** **set size limit...**

In[]:= **Timing**[crexp2 = **CoefficientRules**[exp2, sub5]]

Out[]:=
$$\left\{ 3.79688, \left\{ \{4, 4, 0, 0, 0, 0, 0, 0\} \rightarrow \frac{32}{3 (2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10})^4} - \frac{192 t^2}{(\dots 6 \dots + 2 \dots 1 \dots)^4} + \frac{4912 t^4}{3 (\dots 1 \dots)^4} - \right.$$

$$\frac{26320 t^6}{3 (\dots 1 \dots)^4} + \dots 21 \dots + \frac{467 t^{36}}{3 (\dots 1 \dots)^4} - \frac{44 t^{38}}{3 (\dots 1 \dots)^4} + \frac{2 t^{40}}{3 (2 t^2 - 9 t^4 + \dots 1 \dots - 9 \dots 1 \dots + 2 t^{10})^4},$$

$$\left. \dots 1740 \dots, \{0, 0, 0, 0, 0, 0, 0, 0\} \rightarrow 1 \right\}$$

large output **show less** **show more** **show all** **set size limit...**

In[*]:= Timing[tr = Expand[Plus @@
 ((poly2 /. Rule[ps_List, c_] => c * (Times @@ (ps !)) (ps /. Append[crexp2, _ -> 0]))]]]

$$\begin{aligned}
 \text{Out[*]} = & \left\{ 0.203125, 1 - \frac{390 h}{(2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10})^2} - \frac{12 h}{t^4 (2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10})^2} + \right. \\
 & \frac{102 h}{t^2 (2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10})^2} + \frac{860 h t^2}{(2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10})^2} - \\
 & \frac{1166 h t^4}{(2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10})^2} + \frac{814 h t^6}{(2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10})^2} + \\
 & \frac{436 h t^8}{(2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10})^2} - \frac{2192 h t^{10}}{(2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10})^2} + \\
 & \frac{3212 h t^{12}}{(2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10})^2} - \frac{2640 h t^{14}}{(2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10})^2} + \\
 & \frac{1282 h t^{16}}{(2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10})^2} - \frac{348 h t^{18}}{(2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10})^2} + \\
 & \frac{42 h t^{20}}{(2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10})^2} - \frac{34 h}{2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10}} + \\
 & \frac{6 h}{t^6 (2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10})} - \frac{24 h}{t^4 (2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10})} + \\
 & \frac{42 h}{t^2 (2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10})} - \frac{6 h t^2}{2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10}} + \frac{78 h t^4}{2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10}} - \\
 & \frac{106 h t^6}{2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10}} + \frac{56 h t^8}{2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10}} - \frac{12 h t^{10}}{2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10}} + \\
 & \frac{2 h d_1 z_1}{t^8} + \frac{2 h d_1 z_1}{t^6} + \frac{2 h d_1 z_1}{t^4} + \frac{2 h d_1 z_1}{t^2} + \frac{2 h d_1 z_1}{2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10}} - \\
 & \frac{4 h d_1 z_1}{t^6 (2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10})} + \frac{14 h d_1 z_1}{t^4 (2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10})} - \\
 & \frac{16 h d_1 z_1}{t^2 (2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10})} + \frac{2 h t^2 d_1 z_1}{2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10}} - \\
 & \left. \frac{16 h t^4 d_1 z_1}{2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10}} + \frac{14 h t^6 d_1 z_1}{2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10}} - \frac{4 h t^8 d_1 z_1}{2 t^2 - 9 t^4 + 15 t^6 - 9 t^8 + 2 t^{10}} \right\}
 \end{aligned}$$

In[*]:= (*AbsoluteTiming[tr=trace_n[poly2];]*)

In[*]:= test1 = Together[Coefficient[tr, h, 1]]

$$\text{Out[*]} = (2 (-7 + 44 t^2 - 89 t^4 + 15 t^6 + 190 t^8 - 291 t^{10} + 193 t^{12} - 64 t^{14} + 9 t^{16})) / (2 - 9 t^2 + 15 t^4 - 9 t^6 + 2 t^8)^2$$

In[*]:= p = If[amp == True, Cancel[Denominator[test1] / alex], Cancel[Denominator[test1] / alex^2]]

$$\text{Out[*]} = t^8$$

In[*]:= **series** = If[amp == True,

Normal[**Series**[(((1 + h test1) (1/alex)) /. {t → t Exp[h]}) (alex) /. {h → $\frac{h}{2}$ }] /.
 {h → Sqrt[1 + h] - 1/Sqrt[1 + h]}, {h, 0, 1}]],

Normal[**Series**[(((1 + h test1) (1/alex)) /. {t → t Exp[h]}) alex) /. {h → $\frac{h}{2}$ }, {h, 0, 1}]]]

Out[*]= $1 + \left(h \left(1 - 10 t^2 + 52 t^4 - 138 t^6 + 190 t^8 - 138 t^{10} + 52 t^{12} - 10 t^{14} + t^{16} \right) \right) / \left(2 - 9 t^2 + 15 t^4 - 9 t^6 + 2 t^8 \right)^2$

In[*]:= **p1** = **Expand**[**Numerator**[**Coefficient**[**series**, **h**, **1**]] / **p**]

Out[*]= $190 + \frac{1}{t^8} - \frac{10}{t^6} + \frac{52}{t^4} - \frac{138}{t^2} - 138 t^2 + 52 t^4 - 10 t^6 + t^8$

In[*]:= **SessionTime** []

Out[*]= 39.4128165

In[*]:= **TimeUsed** []

Out[*]= 27.032