

Pensieve header: Fuller output of for 8_{17} .

```
SetDirectory["C:\\drorbn\\AcademicPensieve\\Projects\\WKO4"];
<< FreeLie.m;
<< AwCalculus.m;
Rl[a_, b_] := El[⟨a → LS[0], b → LS[LW@a]⟩, CWS[0]];
iRl[a_, b_] := El[⟨a → LS[0], b → -LS[LW@a]⟩, CWS[0]];
Rs[a_, b_] := Es[⟨a → LS[0], b → LS[LW@a]⟩, CWS[0]];
iRs[a_, b_] := Es[⟨a → LS[0], b → -LS[LW@a]⟩, CWS[0]];
ξ = iRs[12, 1] iRs[2, 7] iRs[8, 3] iRs[4, 11] Rs[16, 5] Rs[6, 13] Rs[14, 9] Rs[10, 15];
Do[ξ = ξ // dm[1, k, 1], {k, 2, 16}];
ξ

FreeLie` implements / extends
{*, +, **, $SeriesShowDegree, ⟨⟩, ∫, ≡, ad, Ad, adSeries, AllCyclicWords, AllLyndonWords,
AllWords, Arbitrator, ASeries, AW, b, BCH, BooleanSequence, BracketForm, BS, CC, Crop, cw,
CW, CWS, CWSeries, D, Deg, DegreeScale, DerivationSeries, div, DK, DKS, DKSeries, EulerE,
Exp, Inverse, j, J, JA, LieDerivation, LieMorphism, LieSeries, LS, LW, LyndonFactorization,
Morphism, New, RandomCWSeries, Randomizer, RandomLieSeries, RC, SeriesSolve, Support,
t, tb, TopBracketForm, tr, UndeterminedCoefficients, αMap, Γ, ℓ, Λ, σ, ħ, ↦, ↠}.
```

FreeLie` is in the public domain. Dror Bar-Natan is committed to support it within reason until July 15, 2022. This is version 150814.

AwCalculus` implements / extends {*, **, ≡, dA, dc, deg, dm, dS, dΔ, dη, dσ, El, Es, hA, hm, hS, hΔ, hη, hσ, RandomElSeries, RandomEsSeries, tA, tha, tm, tS, tΔ, tη, tσ, Γ, Δ}.

AwCalculus` is in the public domain. Dror Bar-Natan is committed to support it within reason until July 15, 2022. This is version 150909.

Es[⟨1 → LS[0, 0, 0, ...]⟩, CWS[0, $\overline{11}$, 0, ...]]

ξ@{8} // Timing

```
{686.125, Es[⟨1 → LS[0, 0, 0, 0, 0, 0, 0, 0, ...]⟩,
CWS[0,  $\overline{11}$ , 0,  $-\frac{31 \overline{1111}}$ , 0,  $-\frac{1351 \overline{111111}}$ , 0,  $-\frac{123271 \overline{11111111}}$ , ...]]}
```

The same thing, copy-paste ready and machine readable:

Sum[ξ[[2]][k], {k, 8}] // InputForm

```
-CW[1, 1] - (31*CW[1, 1, 1, 1])/12 - (1351*CW[1, 1, 1, 1, 1])/360 -
(123271*CW[1, 1, 1, 1, 1, 1, 1, 1])/20160
```

ξ@{10} // Timing

The same thing, copy-paste ready and machine readable:

Sum[ξ[[2]][k], {k, 10}] // InputForm

Comparisson with the Alexander polynomial of 8_{17} :

$$\text{Series}\left[\text{Log}\left[-\frac{1}{x^3} + \frac{4}{x^2} - \frac{8}{x} + 11 - 8x + 4x^2 - x^3\right] / . x \rightarrow e^x, \{x, 0, 10\}\right]$$