

Pensieve header: A μ -calculus demo for my Hamburg talk.

```
SetDirectory["/drorbn/AcademicPensieve/2012-08"];
<< muCalculus.m

Format[CW[w_], StandardForm] := "[" <w> "<w>";
```

ExampleZeta

```
T0 = Rm[3, a] Rp[b, 2] Rp[1, 4];
ξ = T0 // dm[2, 1, 1] // dm[4, b, b] // dm[1, a, a] // dm[3, a, a];
ξ[{5}] /. {w_LW => (Deg[w] + 1) ! w, w_CW => Deg[w] ! w}
```

ExampleZeta

```
μ[CWS[-[a], -2[ab], -3[aab] - 3[abb], -4[aaab] + 42[aabb] - 60[abab] - 4[abbb],
-5[aaaab] + 110[aaabb] - 180[aabab] + 110[aabbb] - 180[ababb] - 5[abbbb]],
h[b] LS[2<a>, 0, -24<aab>, -60<aaab> + 60<aabb>,
-120<aaaab> + 900<aaabb> + 360<aabab> - 120<aabbb>] +
h[a] LS[-2<a> + 2<b>, 9<ab>, 26<aab> - 26<abb>, 60<aaab> - 255<aabb> + 60<abbb>,
119<aaaab> - 1504<aaabb> + 118<aabab> + 1504<aabbb> + 1386<ababb> - 119<abbbb>]]

ξ[{10}] /. {w_LW => (Deg[w] + 1) ! * w, w_CW => Deg[w] ! * w}
```

```
μ[CWS[-[a], -2[ab], -3[aab] - 3[abb], -4[aaab] + 42[aabb] - 60[abab] - 4[abbb],
-5[aaaab] + 110[aaabb] - 180[aabab] + 110[aabbb] - 180[ababb] - 5[abbbb],
-6[aaaaab] + 465[aaaabb] - 1320[aaabab] - 2180[aaabbb] + 630[aabaab] + 4140[aababb] +
4140[aabbab] + 465[aabbbb] - 6720[ababab] - 1320[ababbb] + 630[abbabb] - 6[abbbbb],
-7[aaaaaab] + 1239[aaaaabb] - 3150[aaaabab] - 7175[aaaabbb] + 1260[aaabaab] +
6300[aaababb] + 11340[aaabbab] - 7175[aaabbbb] + 15750[aabaabb] -
30240[aababab] + 11340[aababbb] + 15750[aabbabb] + 6300[aabbbab] +
1239[aabbbbb] - 30240[abababb] - 3150[ababbbb] + 1260[abbabbb] - 7[abbbbbbb],
-8[aaaaaaaab] + 3556[aaaaaabb] - 11760[aaaaabab] - 70616[aaaaabbb] + 15960[aaabaab] +
170520[aaaababb] + 150360[aaaabbab] + 215530[aaaabbbb] - 9520[aabaabaab] -
72240[aaabaabb] - 551040[aaababab] - 422240[aaabaabb] + 28560[aaabbaab] -
179760[aaabbabb] - 422240[aaabbbab] - 70616[aaabbbbb] + 322560[aabaabaab] -
179760[aabaabbb] + 1048320[aabababb] + 806400[aabbabb] + 150360[aababbbb] -
298620[aabbaabb] + 1048320[aabbabab] + 28560[aabbabbb] - 72240[aabbbabb] +
170520[aabbbbab] + 3556[aabbbbb] - 1663200[abababab] - 551040[abababbb] +
322560[ababbabb] - 11760[ababbbb] + 15960[abbabbbb] - 9520[abbbabbb] - 8[abbbbbbb],
-9[aaaaaaaaab] + 9036[aaaaaaabb] - 31752[aaaaaabab] - 271236[aaaaaabb] +
40824[aaaaabaab] + 494424[aaaaababb] + 585144[aaaaabbab] + 778554[aaaaabbbb] -
22680[aaaabaab] + 139860[aaaabaabb] - 1451520[aaaababab] - 687960[aaaababbb] +
49140[aaaabbaab] - 223020[aaaabbabb] - 1443960[aaaabbbab] + 778554[aaaabbbbb] -
136080[aaabaabb] - 544320[aaabaabab] - 982800[aaabaabbb] + 544320[aaababaab] +
181440[aaabababb] + 1270080[aaababbab] - 1443960[aaababbbb] - 2033640[aaabbaabb] +
3447360[aaabbabab] - 1648080[aaabbabbb] - 1648080[aaabbaab] -
982800[aaabbbabb] - 687960[aaabbbbab] - 271236[aaabbbbb] + 483840[aabaabaab] +
4354560[aabaababb] + 2540160[aabaabbab] - 223020[aabaabbbb] + 3991680[aababaabb] -
9979200[aabababab] + 3447360[aabababbb] + 2540160[aababbabb] +
1270080[aababbbab] + 585144[aababbbbb] - 2033640[aabbaabb] + 3991680[aabbababb] +
4354560[aabbabbab] + 49140[aabbabbbb] + 181440[aabbabab] - 136080[aabbbabbb] +
139860[aabbbbabb] + 494424[aabbbbbab] + 9036[aabbbbbbb] - 9979200[ababababb] -
1451520[abababbbb] + 544320[ababbabbb] - 544320[ababbbabb] - 31752[ababbbbb] +
483840[abbabbabb] + 40824[abbabbbbb] - 22680[abbbabbbb] - 9[abbbbbbb],
-10[aaaaaaaaaab] + 22995[aaaaaaaabb] - 94320[aaaaaaabab] - 1481880[aaaaaaabbb] +
168840[aaaaaabaab] + 4140360[aaaaaababb] + 3837960[aaaaaabbab] +
15000510[aaaaaabb] - 206640[aaaaabaab] - 4135320[aaaaabaabb] -
12640320[aaaaababab] - 34680240[aaaaababbb] - 1867320[aaaaabbaab] -
```

22 400 280 [aaaaabbabb] - 31 051 440 [aaaaabbbab] - 35 154 252 [aaaaabbbb] +
 97 650 [aaaabaaaab] + 4 296 600 [aaaabaaabb] + 10 584 000 [aaaabaabab] +
 9 689 400 [aaaabaabbb] + 12 398 400 [aaaababaab] + 88 603 200 [aaaabababb] +
 70 459 200 [aaaababbab] + 69 394 500 [aaaababbbb] - 390 600 [aaaabbaaab] -
 21 942 900 [aaaabbaabb] + 79 531 200 [aaaabbabab] + 31 210 200 [aaaabbabbb] -
 4 825 800 [aaaabbaaab] + 30 756 600 [aaaabbbabb] + 69 394 500 [aaaabbbbab] +
 15 000 510 [aaaabbbb] - 17 337 600 [aaabaaabab] - 12 482 400 [aaabaaabbb] +
 2 116 800 [aaabaabaab] - 14 212 800 [aaabaababb] + 2 116 800 [aaabaabbab] +
 30 756 600 [aaabaabbbb] - 12 398 400 [aaababaabb] - 339 292 800 [aaabababab] -
 184 262 400 [aaabababbb] + 29 332 800 [aaababbaab] - 55 944 000 [aaababbabb] -
 140 716 800 [aaababbbab] - 31 051 440 [aaababbbb] + 8 101 800 [aaabbaaabb] +
 23 889 600 [aaabbaabab] + 58 640 400 [aaabbaabbb] + 7 560 000 [aaabbabaab] -
 45 057 600 [aaabbababb] - 46 872 000 [aaabbababb] - 4 825 800 [aaabbabbbb] +
 58 640 400 [aaabbaaabb] - 184 262 400 [aaabbbabab] - 12 482 400 [aaabbbabbb] +
 31 210 200 [aaabbbbbaab] + 9 689 400 [aaabbbbabb] - 34 680 240 [aaabbbbabb] -
 1 481 880 [aaabbbb] - 58 968 000 [aabaabaabb] + 133 358 400 [aabaababab] -
 46 872 000 [aabaababbb] - 98 884 800 [aabaababbab] - 55 944 000 [aabaabbbab] -
 22 400 280 [aabaabbbb] + 81 194 400 [aababaabab] - 45 057 600 [aababaabbb] +
 481 723 200 [aababababb] + 336 571 200 [aabababbab] + 79 531 200 [aabababbbb] -
 178 718 400 [aababbaabb] + 336 571 200 [aababbabab] + 7 560 000 [aababbabbb] +
 2 116 800 [aababbabb] + 70 459 200 [aababbbbab] + 3 837 960 [aababbbb] -
 178 718 400 [aabbaabbab] - 21 942 900 [aabbaabbbb] + 481 723 200 [aabbababab] +
 23 889 600 [aabbababbb] - 58 968 000 [aabbababbab] + 29 332 800 [aabbabbbab] -
 1 867 320 [aabbabbbb] + 8 101 800 [aabbaaabb] - 12 398 400 [aabbbabab] -
 14 212 800 [aabbbababb] - 390 600 [aabbbabbbb] + 88 603 200 [aabbbbabab] +
 4 296 600 [aabbbbabbb] - 4 135 320 [aabbbbabb] + 4 140 360 [aabbbbabb] +
 22 995 [aabbbb] - 726 485 760 [ababababab] - 339 292 800 [ababababbb] +
 133 358 400 [ababababb] - 12 640 320 [abababbbb] + 81 194 400 [ababbababb] +
 12 398 400 [ababbabbbb] - 17 337 600 [ababbabbbb] + 10 584 000 [ababbbbabb] -
 94 320 [ababbbb] + 2 116 800 [abbabbabb] + 168 840 [abbabbbb] -
 206 640 [abbabbbb] + 97 650 [abbbbabbbb] - 10 [abbbb] ,
 h[b] LS[2 <a>, 0, -24 <aab>, -60 <aaab> + 60 <aabb> ,
 -120 <aaaab> + 900 <aaabb> + 360 <aabab> - 120 <aabbb>, -210 <aaaaab> + 5460 <aaaabb> +
 840 <aaabab> - 5460 <aaabbb> - 6300 <aababb> - 2520 <aabbab> + 210 <aabbbb> ,
 -336 <aaaaaab> + 24 360 <aaaaabb> - 5040 <aaaabab> - 81 760 <aaaabbb> - 1680 <aaabaab> -
 104 160 <aaababb> - 6720 <aaabbab> + 24 360 <aaabbbb> - 40 320 <aabaabb> -
 6720 <aababab> + 43 680 <aababbb> + 5040 <aabbabb> + 6720 <aabbbab> - 336 <aabbbb> ,
 -504 <aaaaaaaab> + 92 232 <aaaaaabb> - 57 456 <aaaaaabab> - 758 520 <aaaaabbb> -
 6048 <aaaabaab> - 884 520 <aaaababb> + 529 200 <aaaabbab> + 758 520 <aaaabbbb> -
 143 640 <aaabaabb> - 75 600 <aaababab> + 1 643 040 <aaababbb> + 196 560 <aaabbaab> +
 196 560 <aaabbabb> - 342 720 <aaabbbab> - 92 232 <aaabbbb> + 30 240 <aabaabab> +
 362 880 <aabaabbb> + 937 440 <aabababb> + 453 600 <aababbab> - 219 240 <aababbbb> +
 90 720 <aabbabab> - 136 080 <aabbabbb> - 30 240 <aabbabb> - 15 120 <aabbbbab> +
 504 <aabbbb> , -720 <aaaaaaaab> + 315 000 <aaaaaabb> - 337 680 <aaaaaabab> -
 5 448 240 <aaaaabbb> + 15 120 <aaaaabaab> - 5 307 120 <aaaaababb> +
 9 041 760 <aaaaabbab> + 13 034 700 <aaaaabbbb> + 5040 <aaaabaaab> +
 1 995 840 <aaaabaabb> - 1 542 240 <aaaababab> + 28 954 800 <aaaababbb> +
 1 572 480 <aaaabbaab> - 1 020 600 <aaaabbabb> - 19 504 800 <aaaabbbab> -
 5 448 240 <aaaabbbb> + 907 200 <aaabaaabb> + 181 440 <aaabaabab> - 327 600 <aaabaabbb> -
 453 600 <aaababaab> + 23 360 400 <aaabababb> + 1 134 000 <aaababbab> -
 16 203 600 <aaababbbb> + 869 400 <aaabbaabb> + 5 670 000 <aaabbabab> -
 12 146 400 <aaabbabbb> - 5 493 600 <aaabbaabb> - 1 915 200 <aaabbbabb> +
 5 392 800 <aaabbbbab> + 315 000 <aaabbbb> + 7 106 400 <aabaababb> -
 302 400 <aabaabbab> - 2 116 800 <aabaabbbb> + 1 965 600 <aabaabaabb> +

$$\begin{aligned}
& 151\,200 \langle \text{aabababab} \rangle - 16\,430\,400 \langle \text{aabababbbb} \rangle + 756\,000 \langle \text{aababbabb} \rangle - \\
& 3\,931\,200 \langle \text{aababbbbab} \rangle + 922\,320 \langle \text{aababbbbb} \rangle - 1\,209\,600 \langle \text{aabbaabbb} \rangle - \\
& 2\,268\,000 \langle \text{aabbbababb} \rangle - 453\,600 \langle \text{aabbbabbab} \rangle + 945\,000 \langle \text{aabbbabbbb} \rangle - 302\,400 \langle \text{aabbbbabab} \rangle + \\
& 50\,400 \langle \text{aabbbbabbb} \rangle + 75\,600 \langle \text{aabbbbabb} \rangle + 30\,240 \langle \text{aabbbbabb} \rangle - 720 \langle \text{aabbbbbbb} \rangle, \\
& -990 \langle \text{aaaaaaaaab} \rangle + 1\,001\,880 \langle \text{aaaaaaaaabb} \rangle - 1\,544\,400 \langle \text{aaaaaaaaabab} \rangle - \\
& 33\,384\,120 \langle \text{aaaaaaaaabbb} \rangle + 300\,960 \langle \text{aaaaaabaab} \rangle - 24\,643\,080 \langle \text{aaaaaababb} \rangle + \\
& 91\,087\,920 \langle \text{aaaaaababb} \rangle + 160\,512\,660 \langle \text{aaaaaabbbb} \rangle + 23\,760 \langle \text{aaaaabaaab} \rangle + \\
& 33\,347\,160 \langle \text{aaaaabaabb} \rangle - 24\,670\,800 \langle \text{aaaaababab} \rangle + 346\,555\,440 \langle \text{aaaaababbb} \rangle - \\
& 2\,494\,800 \langle \text{aaaaabbaab} \rangle - 99\,708\,840 \langle \text{aaaaabbabb} \rangle - 437\,865\,120 \langle \text{aaaaabbbab} \rangle - \\
& 160\,512\,660 \langle \text{aaaaabbbb} \rangle + 6\,514\,200 \langle \text{aaaabaaabb} \rangle - 6\,930\,000 \langle \text{aaaabaabab} \rangle - \\
& 144\,809\,280 \langle \text{aaaabaabbb} \rangle - 4\,934\,160 \langle \text{aaaababaab} \rangle + 339\,459\,120 \langle \text{aaaabababb} \rangle - \\
& 104\,282\,640 \langle \text{aaaababbab} \rangle - 507\,068\,100 \langle \text{aaaababbbb} \rangle - 3\,381\,840 \langle \text{aaaabbaaab} \rangle + \\
& 6\,486\,480 \langle \text{aaaabbaabb} \rangle + 246\,652\,560 \langle \text{aaaabbabab} \rangle - 369\,923\,400 \langle \text{aaaabbabbb} \rangle - \\
& 66\,749\,760 \langle \text{aaaabbbbaab} \rangle + 82\,882\,800 \langle \text{aaaabbabb} \rangle + 390\,713\,400 \langle \text{aaaabbabbab} \rangle + \\
& 33\,384\,120 \langle \text{aaaabbbb} \rangle - 3\,548\,160 \langle \text{aaabaaabab} \rangle - 49\,896\,000 \langle \text{aaabaaabbb} \rangle + \\
& 166\,320 \langle \text{aaabaabaab} \rangle + 30\,602\,880 \langle \text{aaabaababb} \rangle + 62\,868\,960 \langle \text{aaabaabbab} \rangle + \\
& 60\,221\,700 \langle \text{aaabaabbbb} \rangle + 41\,746\,320 \langle \text{aaababaabb} \rangle - 9\,646\,560 \langle \text{aaabababab} \rangle - \\
& 733\,194\,000 \langle \text{aaabababbb} \rangle - 54\,054\,000 \langle \text{aaababbaab} \rangle + 140\,956\,200 \langle \text{aaababbabb} \rangle + \\
& 135\,550\,800 \langle \text{aaababbbab} \rangle + 124\,795\,440 \langle \text{aaababbbb} \rangle - 10\,810\,800 \langle \text{aaabbaabab} \rangle - \\
& 51\,975\,000 \langle \text{aaabbaabbb} \rangle + 58\,212\,000 \langle \text{aaabbabaab} \rangle - 111\,018\,600 \langle \text{aaabbababb} \rangle - \\
& 59\,459\,400 \langle \text{aaabbabbab} \rangle + 156\,479\,400 \langle \text{aaabbabbbb} \rangle - 6\,375\,600 \langle \text{aaabbbaabb} \rangle - \\
& 153\,846\,000 \langle \text{aaabbbabab} \rangle + 13\,490\,400 \langle \text{aaabbbabbb} \rangle + 71\,656\,200 \langle \text{aaabbbbbaab} \rangle - \\
& 6\,375\,600 \langle \text{aaabbbbabb} \rangle - 49\,785\,120 \langle \text{aaabbbbabb} \rangle - 1\,001\,880 \langle \text{aaabbbbbbb} \rangle - \\
& 3\,326\,400 \langle \text{aabaabaabb} \rangle + 4\,989\,600 \langle \text{aabaababab} \rangle - 159\,112\,800 \langle \text{aabaababbb} \rangle - \\
& 19\,126\,800 \langle \text{aabaabbabb} \rangle + 41\,025\,600 \langle \text{aabaabbbab} \rangle + 9\,979\,200 \langle \text{aabaabbbb} \rangle - \\
& 20\,512\,800 \langle \text{aababaabbb} \rangle - 253\,638\,000 \langle \text{aababababb} \rangle - 103\,118\,400 \langle \text{aabababbab} \rangle + \\
& 178\,239\,600 \langle \text{aabababbbb} \rangle - 10\,810\,800 \langle \text{aababbaabb} \rangle - 24\,948\,000 \langle \text{aababbabab} \rangle + \\
& 123\,631\,200 \langle \text{aababbabbb} \rangle - 38\,808\,000 \langle \text{aababbabb} \rangle + 24\,116\,400 \langle \text{aababbbbab} \rangle - \\
& 3\,465\,000 \langle \text{aababbbb} \rangle + 21\,621\,600 \langle \text{aabbaabbab} \rangle + 9\,979\,200 \langle \text{aabbaabbbb} \rangle - \\
& 3\,326\,400 \langle \text{aabbbababab} \rangle + 21\,621\,600 \langle \text{aabbbababb} \rangle + 831\,600 \langle \text{aabbbabbab} \rangle + \\
& 14\,968\,800 \langle \text{aabbbabbab} \rangle - 4\,740\,120 \langle \text{aabbbabbbb} \rangle + 8\,316\,000 \langle \text{aabbbbabab} \rangle + \\
& 3\,326\,400 \langle \text{aabbbbabbab} \rangle - 2\,356\,200 \langle \text{aabbbbabbb} \rangle + 831\,600 \langle \text{aabbbbabbab} \rangle - \\
& 277\,200 \langle \text{aabbbbabbb} \rangle - 166\,320 \langle \text{aabbbbabb} \rangle - 55\,440 \langle \text{aabbbbabbab} \rangle + 990 \langle \text{aabbbbabb} \rangle] + \\
& h[a] \text{LS} \left[-2 \langle a \rangle + 2 \langle b \rangle, 9 \langle ab \rangle, 26 \langle aab \rangle - 26 \langle abb \rangle, 60 \langle aaab \rangle - 255 \langle aabb \rangle + 60 \langle abbb \rangle, \right. \\
& 119 \langle aaaab \rangle - 1504 \langle aaabb \rangle + 118 \langle aabab \rangle + 1504 \langle aabbb \rangle + 1386 \langle ababb \rangle - 119 \langle abbbb \rangle, \\
& 210 \langle aaaaaab \rangle - \frac{13\,839 \langle aaaabb \rangle}{2} + 1659 \langle aaabab \rangle + 18\,522 \langle aaabbb \rangle + 21\,063 \langle aababb \rangle - \\
& 6720 \langle aabbab \rangle - \frac{13\,839 \langle aabbbb \rangle}{2} - 12\,180 \langle ababbb \rangle + 210 \langle abbbb \rangle, \\
& \frac{1012 \langle aaaaaab \rangle}{3} - 27\,376 \langle aaaaabb \rangle + 13\,212 \langle aaaabab \rangle + \frac{484\,376 \langle aaaaabbb \rangle}{3} - \\
& 340 \langle aaabaab \rangle + 181\,408 \langle aaababb \rangle - 148\,816 \langle aaabbab \rangle - \frac{484\,376 \langle aaabbbb \rangle}{3} - \\
& 26\,916 \langle aabaabb \rangle + 12\,872 \langle aababab \rangle - \frac{1\,028\,600 \langle aababbb \rangle}{3} - 340 \langle aabbabb \rangle + \\
& \frac{402\,608 \langle aabbbab \rangle}{3} + 27\,376 \langle aabbbb \rangle - 167\,024 \langle abababb \rangle + 68\,916 \langle ababbbb \rangle + \\
& 41\,880 \langle abbabbb \rangle - \frac{1012 \langle abbbb \rangle}{3}, 504 \langle aaaaaab \rangle - 97\,794 \langle aaaaaabb \rangle + \\
& 78\,192 \langle aaaaabab \rangle + 1\,143\,972 \langle aaaaabbb \rangle - 6102 \langle aaaabaab \rangle + 1\,149\,570 \langle aaaababb \rangle - \\
& 1\,860\,336 \langle aaaabbab \rangle - 2\,427\,975 \langle aaaaabbbb \rangle - 557\,154 \langle aaabaabb \rangle + 326\,484 \langle aaababab \rangle -
\end{aligned}$$

5 320 692 ⟨aaababbb⟩ + 96 768 ⟨aaabbaab⟩ + 579 042 ⟨aaabbabb⟩ + 4 391 208 ⟨aaabbbab⟩ +
 1 143 972 ⟨aaabbbbbb⟩ + 71 568 ⟨aabaabab⟩ + 1 043 784 ⟨aabaabbb⟩ - 4 026 888 ⟨aabababb⟩ +
 954 072 ⟨aababbab⟩ + 3 437 514 ⟨aababbbb⟩ - 1 227 744 ⟨abbababab⟩ + 2 463 948 ⟨abbabbbb⟩ -
 172 368 ⟨abbbbabb⟩ - 1 560 384 ⟨abbbbbab⟩ - 97 794 ⟨abbbbbbb⟩ + 3 458 448 ⟨abababbb⟩ -
 603 288 ⟨ababbabb⟩ - 312 984 ⟨ababbbb⟩ - 338 688 ⟨abbabbbb⟩ + 504 ⟨abbbbbbb⟩ ,
 717 ⟨aaaaaaaab⟩ - 324 384 ⟨aaaaaaabb⟩ + 382 116 ⟨aaaaaabab⟩ + 7 058 696 ⟨aaaaaabbb⟩ -
 60 120 ⟨aaaaabaab⟩ + 5 841 996 ⟨aaaaababb⟩ - 17 291 472 ⟨aaaaabbab⟩ -
 28 052 508 ⟨aaaaabbbb⟩ + 708 ⟨aaaabaaab⟩ - 6 466 266 ⟨aaaabaabb⟩ +
 4 676 484 ⟨aaaababab⟩ - 60 359 292 ⟨aaaababbb⟩ + 2 485 224 ⟨aaaabbaab⟩ +
 18 300 042 ⟨aaaabbabb⟩ + 80 577 576 ⟨aaaabbbab⟩ + 28 052 508 ⟨aaaabbbbb⟩ +
 322 524 ⟨aaabaaabb⟩ + 1 777 536 ⟨aaabaabab⟩ + 31 408 644 ⟨aaabaabbb⟩ -
 500 760 ⟨aaababaab⟩ - 57 463 236 ⟨aaabababb⟩ + 24 087 852 ⟨aaabbabab⟩ +
 88 411 800 ⟨aaababbbb⟩ + 3186 ⟨aaabbaabb⟩ - 48 619 548 ⟨aaabbabab⟩ +
 61 931 760 ⟨aaabbabbb⟩ - 6 713 832 ⟨aaabbaaab⟩ - 26 692 800 ⟨aaabbbabb⟩ -
 79 228 920 ⟨aaabbbbab⟩ - 7 058 696 ⟨aaabbbbbbb⟩ + 5 905 656 ⟨aabaababb⟩ -
 18 975 528 ⟨aabaabbab⟩ - 21 879 990 ⟨aabaabbbb⟩ - 5 251 896 ⟨aababaabb⟩ +
 2 484 648 ⟨aabababab⟩ + 127 246 440 ⟨aabababbb⟩ - 35 206 380 ⟨aababbabb⟩ -
 47 469 240 ⟨aababbbbab⟩ - 27 018 084 ⟨aababbbbb⟩ - 544 500 ⟨aabbaabbb⟩ +
 8 532 180 ⟨aabbbabab⟩ + 14 016 060 ⟨aabbbabbb⟩ - 34 193 190 ⟨aabbbabbb⟩ +
 36 240 840 ⟨aabbbbabab⟩ - 1 244 200 ⟨aabbbbabbb⟩ + 5 396 340 ⟨aabbbbabb⟩ +
 13 376 712 ⟨aabbbbbbab⟩ + 324 384 ⟨aabbbbbbbb⟩ + 41 505 480 ⟨ababababb⟩ -
 41 156 520 ⟨abababbbb⟩ - 27 341 760 ⟨ababbabbb⟩ + 17 321 520 ⟨ababbbabb⟩ +
 1 239 804 ⟨ababbbbbbb⟩ + 1 833 228 ⟨abbabbbbb⟩ + 917 100 ⟨abbbabbbb⟩ - 717 ⟨abbbbbbbb⟩ ,
 990 ⟨aaaaaaaaab⟩ - $\frac{2\,033\,361 \langle aaaaaaaabb \rangle}{2}$ + 1 629 243 ⟨aaaaaaabab⟩ +
 39 463 116 ⟨aaaaaaabbb⟩ - 429 165 ⟨aaaaaabaab⟩ + 24 186 162 ⟨aaaaaababb⟩ -
 133 096 128 ⟨aaaaaabbab⟩ - 271 774 239 ⟨aaaaabbbb⟩ + 15 642 ⟨aaaaabaab⟩ -
 55 553 124 ⟨aaaaabaabb⟩ + 49 696 416 ⟨aaaaababab⟩ - 559 390 128 ⟨aaaaababbb⟩ +
 35 365 176 ⟨aaaaabbaab⟩ + 322 291 728 ⟨aaaaababb⟩ + 1 091 473 944 ⟨aaaaabbbab⟩ +
 500 213 142 ⟨aaaaabbbbb⟩ + 8 362 266 ⟨aaaabaaabb⟩ + 24 425 544 ⟨aaaabaabab⟩ +
 532 704 546 ⟨aaaabaabbb⟩ - 14 825 580 ⟨aaaababaab⟩ - 645 712 254 ⟨aaaabababb⟩ +
 310 072 158 ⟨aaaababbab⟩ + 1 589 948 085 ⟨aaaababbbb⟩ - 1 013 760 ⟨aaaabbaaab⟩ -
 11 791 791 ⟨aaaabbaabb⟩ - 1 055 072 502 ⟨aaaabbabab⟩ + 988 567 470 ⟨aaaabbabbb⟩ -
 236 741 868 ⟨aaaabbbaab⟩ - 1 097 809 680 ⟨aaaabbabb⟩ - 2 161 650 480 ⟨aaaabbbbab⟩ -
 271 774 239 ⟨aaaabbbbbbb⟩ - 1 602 480 ⟨aaabaaabab⟩ - 38 307 720 ⟨aaabaaabbb⟩ +
 384 120 ⟨aaabaabaab⟩ + 151 412 184 ⟨aaabaababb⟩ - 667 138 032 ⟨aaabaabbab⟩ -
 940 795 845 ⟨aaabaabbbb⟩ - 173 235 744 ⟨aaababaabb⟩ + 108 772 092 ⟨aaabababab⟩ +
 2 680 680 420 ⟨aaabababbb⟩ - 23 732 280 ⟨aaababbaab⟩ - 1 082 098 710 ⟨aaababbabb⟩ -
 1 969 678 260 ⟨aaababbbab⟩ - 1 102 938 606 ⟨aaababbbb⟩ + 24 021 360 ⟨aaabbaabab⟩ -
 157 919 190 ⟨aaabbaabbb⟩ + 144 195 480 ⟨aaabbabaab⟩ + 321 529 230 ⟨aaabbababb⟩ +
 1 047 953 610 ⟨aaabbabbab⟩ - 1 437 458 715 ⟨aaabbabbbb⟩ + 1 271 160 ⟨aaabbbbaab⟩ +
 2 047 971 420 ⟨aaabbbbabab⟩ + 68 565 420 ⟨aaabbbbabbb⟩ + 234 463 680 ⟨aaabbbbbaab⟩ +
 614 361 330 ⟨aaabbbbabb⟩ + 1 051 036 668 ⟨aaabbbbbbab⟩ + 39 463 116 ⟨aaabbbbbbbb⟩ -
 69 662 340 ⟨aabaabaabb⟩ + 54 469 800 ⟨aabaababab⟩ - 495 252 120 ⟨aabaababbb⟩ +
 247 466 340 ⟨aabaabbabb⟩ + 1 022 557 800 ⟨aabaabbbab⟩ + 317 914 740 ⟨aabaabbbbb⟩ +
 295 573 080 ⟨aababaabbb⟩ + 1 415 868 300 ⟨aababababb⟩ - 542 381 400 ⟨aabababbab⟩ -
 2 317 991 940 ⟨aabababbbb⟩ + 38 016 000 ⟨aababbaabb⟩ + 171 741 240 ⟨aababbabab⟩ -
 1 451 213 280 ⟨aababbabbb⟩ + 1 650 500 280 ⟨aababbbabb⟩ + 1 010 597 940 ⟨aababbbbab⟩ +
 182 038 626 ⟨aababbbbbbb⟩ - 24 110 460 ⟨aabbaabbab⟩ + 45 456 840 ⟨aabbaabbbb⟩ -
 414 307 080 ⟨aabbbababab⟩ + 53 420 400 ⟨aabbbababbb⟩ - 58 366 440 ⟨aabbbababb⟩ +
 674 146 440 ⟨aabbbabbbb⟩ + 316 863 162 ⟨aabbbabbbb⟩ - 256 964 400 ⟨aabbbababb⟩ -
 575 902 800 ⟨aabbbabbab⟩ + 185 952 690 ⟨aabbbabbbb⟩ - 714 930 480 ⟨aabbbbabab⟩ +
 11 799 480 ⟨aabbbbabbb⟩ - 67 854 600 ⟨aabbbbbabbb⟩ - 94 773 360 ⟨aabbbbbbab⟩ -