

```
(Alt) In[ ]:=
SetDirectory["C:\\drorbn\\AcademicPensieve\\Talks\\UBC-241004"]
```

```
(Alt) Out[ ]:=
C:\\drorbn\\AcademicPensieve\\Talks\\UBC-241004
```

```
(Alt) In[ ]:=
os = Get["../Projects/HigherRank/Data/theta3-15.m"]
```

```
(Alt) Out[ ]:=
```

$$\left\{ \text{Knot}[3, 1] \rightarrow \left\{ \frac{1-T+T^2}{T}, -\frac{1-T_1+T_1^2-T_2-T_1^3 T_2+T_2^2+T_1^4 T_2^2-T_1 T_2^3-T_1^4 T_2^3+T_1^2 T_2^4-T_1^3 T_2^4+T_1^4 T_2^4}{T_1^2 T_2^2} \right\}, \right.$$

$$\text{Knot}[4, 1] \rightarrow \left\{ -\frac{1-3T+T^2}{T}, \emptyset \right\}, \text{Knot}[5, 1] \rightarrow \left\{ \dots, 1 \dots, \dots, 313224 \dots, \dots, 1 \dots, \right.$$

$$\left. \text{Knot}[15, \text{NonAlternating}, 168029] \rightarrow \left\{ -\frac{(\dots)^2 (\dots)}{T^4}, -\frac{2 \dots 3 \dots (\dots)}{T_1^8 T_2^8} \right\}, \text{Knot}[15, \text{NonAlternating}, 168030] \rightarrow \right.$$

$$\left. \left\{ \frac{(1-T+T^2)(1-12T+35T^2-47T^3+35T^4-12T^5+T^6)}{T^4}, \frac{2-26T_1+96T_1^2-188T_1^3+234T_1^4-188T_1^5, \dots, 321 \dots +234T_1^{12}T_2^{16}-188T_1^{13}T_2^{16}+96T_1^{14}T_2^{16}-26T_1^{15}T_2^{16}+2T_1^{16}T_2^{16}}{T_1^8 T_2^8} \right\} \right\}$$

Full expression not available (original memory size: 16.5 GB)

```
(Alt) In[ ]:=
Length[os]
```

```
(Alt) Out[ ]:=
313230
```

```
(Alt) In[ ]:=
Length[hs = Get["../Projects/HigherRank/Data/HOMFLYPT3-15.m"]]
```

```
(Alt) Out[ ]:=
313230
```

```
(Alt) In[ ]:=
Length[khs = Get["../Projects/HigherRank/Data/Kh3-15.m"]]
```

```
(Alt) Out[ ]:=
313230
```

```
(Alt) In[ ]:=
HKhs = MapThread[{#1[[1]] -> Expand@{#1[[2]], #2[[2]]} &, {hs, khs}]
```

```
(Alt) Out[ ]:=
```

$$\left\{ \text{Knot}[3, 1] \rightarrow \left\{ 2a^2 - a^4 + a^2 z^2, \frac{1}{q^3} + \frac{1}{q} + \frac{1}{q^3 t^3} + \frac{1}{q^3 t^2} \right\}, \dots, 313228 \dots, \text{Knot}[15, \text{NonAlternating}, 168030] \rightarrow \right.$$

$$\left\{ 4 + \frac{3}{a^4} - \frac{6}{a^2} + 7z^2 - \frac{z^2}{a^{10}} + \frac{4z^2}{a^8} - \frac{3z^2}{a^6} + \frac{5z^2}{a^4} - \frac{15z^2}{a^2} + 3z^4 + \frac{3z^4}{a^8} - \frac{6z^4}{a^6} + \frac{3z^4}{a^4} - \frac{13z^4}{a^2} - \frac{3z^6}{a^6} + \frac{2z^6}{a^4} - \frac{4z^6}{a^2} + \frac{z^8}{a^4}, \right.$$

$$28q^3 + 21q^5 + \frac{3}{q^3 t^4} + \frac{6}{q^3 t^3} + \frac{3}{q t^3} + \frac{14}{q t^2} + \frac{6q}{t^2} + \frac{20q}{t} + \frac{14q^3}{t} + 32q^5 t + 27q^7 t + 32q^7 t^2 + 32q^9 t^2 + 29q^9 t^3 + 32q^{11} t^3 +$$

$$\left. \left. 23q^{11} t^4 + 29q^{13} t^4 + 15q^{13} t^5 + 23q^{15} t^5 + 8q^{15} t^6 + 15q^{17} t^6 + 4q^{17} t^7 + 8q^{19} t^7 + q^{19} t^8 + 4q^{21} t^8 + q^{23} t^9 \right\} \right\}$$

Full expression not available (original memory size: 3.2 GB)

(Alt) In[]:=

```
HKhes = MapThread [ (#1[[1]] → Expand@ {#1[[2]], #2[[2]]} ) &, {HKhs, es} ]
```

(Alt) Out[]=

$$\left\{ \text{Knot}[3, 1] \rightarrow \left\{ \left\{ 2a^2 - a^4 + a^2 z^2, \frac{1}{q^3} + \frac{1}{q} + \frac{1}{q^3 t^3} + \frac{1}{q^5 t^2} \right\}, \right. \right.$$

$$\left. \left\{ -1 + \frac{1}{t} + T, -\frac{1}{T^2} - T^2 - \frac{1}{T^2} - \frac{1}{T^2 T^2} + \frac{1}{T_1 T^2} + \frac{1}{T_1^2 T^2} + \frac{T_1}{T_2} + \frac{T_2}{T_1} + T_1^2 T_2 - T_2^2 + T_1 T_2^2 - T_1^2 T_2^2 \right\}, \right.$$

$$\left. \dots 313228 \dots, \text{Knot}[15, \text{NonAlternating}, 168030] \rightarrow \right.$$

$$\left\{ \left\{ 4 + \frac{3}{a^4} - \frac{6}{a^2} + 7Z^2 - \frac{z^2}{a^{10}} + \frac{4z^2}{a^8} - \frac{3z^2}{a^6} + \frac{5z^2}{a^4} - \frac{15z^2}{a^2} + 3Z^4 + \frac{3z^4}{a^8} - \frac{6z^4}{a^6} + \frac{3z^4}{a^4} - \frac{13z^4}{a^2} - \frac{3z^6}{a^6} + \frac{2z^6}{a^4} - \frac{4z^6}{a^2} + \frac{z^8}{a^4}, \right. \right.$$

$$28q^3 + 21q^5 + \frac{3}{q^3 t^4} + \frac{6}{q^3 t^3} + \frac{3}{q t^3} + \frac{14}{q t^2} + \frac{6q}{t^2} + \frac{20q}{t} + \dots 10 \dots + 23q^{15} t^5 + 8q^{15} t^6 +$$

$$\left. 15q^{17} t^6 + 4q^{17} t^7 + 8q^{19} t^7 + q^{19} t^8 + 4q^{21} t^8 + q^{23} t^9 \right\}, \left\{ 117 + \dots 11 \dots + T^4, \dots 1 \dots \right\} \right\}$$

Full expression not available (original memory size: 18.9 GB)

(Alt) In[]:=

```
Stats[n_] := Module[{a, b},
  {a = Length@Select[es, #[[1, 1]] ≤ n &],
  b = Length@Union@Expand[Last /@ Select[HKhs, #[[1, 1]] ≤ n &]], b - a,
  b = Length@Union@Expand[Last /@ Select[es, #[[1, 1]] ≤ n &] /. T2 → 1], b - a,
  b = Length@Union@Expand[Last /@ Select[es, #[[1, 1]] ≤ n &]], b - a,
  b = Length@Union@Expand[Last /@ Select[HKhes, #[[1, 1]] ≤ n &]], b - a
}]
```

(Alt) In[]:=

```
Stats[10]
```

(Alt) Out[]=

{249, 248, -1, 249, 0, 249, 0, 249, 0}

(Alt) In[]:=

```
Stats[11]
```

(Alt) Out[]=

{801, 771, -30, 787, -14, 798, -3, 798, -3}

(Alt) In[]:=

```
Stats[12]
```

(Alt) Out[]=

{2977, 2763, -214, 2882, -95, 2958, -19, 2959, -18}

(Alt) In[]:=

```
Stats[13]
```

(Alt) Out[]=

{12965, 11194, -1771, 12006, -959, 12771, -194, 12780, -185}

(Alt) In[]:=

```
Stats[14]
```

(Alt) Out[]=

{59937, 49149, -10788, 53684, -6253, 58819, -1118, 58875, -1062}

(Alt) In[]:=

```

$$\frac{-10788}{-1118} // \mathbf{N}$$

```

(Alt) Out[]=

9.64937

(Alt) In[]:=
Stats [15]

(Alt) Out[]=
{ 313 230, 242 985, -70 245, 270 316, -42 914, 306 472, -6758, 306 675, -6555 }

(Alt) In[]:=
$$\frac{-70\,245}{-6758} // N$$

(Alt) Out[]=
10.3943