

Pensieve header: The GST-48 knot. Continues pensieve://2016-09/.

```
Date []
SetDirectory["C:\\drorbn\\AcademicPensieve\\Projects\\FullDoPeGD0"];
Once[<< KnotTheory`];
Once[Get@"../Profile/Profile.m"];
BeginProfile[];
$k = 1;
<< Engine.m
<< Objects.m
<< KT.m
```

This version: April 2020. Original version: July 1994.

```
HL[ $\mathcal{E}$ ] := Style[ $\mathcal{E}$ , Background  $\rightarrow$  If[TrueQ@ $\mathcal{E}$ , , ]];
```

```
Import ["../.. /2016-09/GST48-Marked.png"]
```



(Alt) In[]:=

```

PD[GST48] = PD[
  X[01, 15, 02, 14], X[29, 02, 30, 03],
  X[40, 04, 41, 03], X[04, 44, 05, 43], X[05, 26, 06, 27],
  X[95, 07, 96, 06], X[07, 01, 08, 96], X[08, 14, 09, 13],
  X[28, 09, 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] ];

```

(Alt) In[]:= Alexander[GST48][t] // Factor

(Alt) Out[]:=
$$-\frac{(-1 + 2t - t^2 - t^3 + 2t^4 - t^5 + t^8)(-1 + t^3 - 2t^4 + t^5 + t^6 - 2t^7 + t^8)}{t^8}$$

(Alt) In[]:= KnotSignature[GST48]

(Alt) Out[]:= 0

(Alt) In[]:= With[{f = -1 + 2t - t^2 - t^3 + 2t^4 - t^5 + t^8},
 HL@Simplify[Alexander[GST48][t] == f (f /. t -> 1/t)]]

(Alt) Out[]:= True

(Alt) In[]:= Block[{\$k = 1}, Z[Knot[3, 1]]]

KnotTheory: Loading precomputed data in PD4Knots`.

(Alt) Out[]:=
$$\mathbb{E}_{\{\} \rightarrow \{\emptyset\}} \left[-2t \hbar - \log \left[\frac{1}{T^3} - \frac{2}{T^2} + \frac{2}{T} \right] - \log \left[1 + \frac{T}{1 - 2T + 2T^2} - \frac{T^2}{1 - 2T + 2T^2} \right], \right.$$

$$\left. \frac{2a(-1+T)(1+T)\hbar}{1-T+T^2} + \frac{(-1+T)(2-T+T^2)\hbar}{(1-T+T^2)^2} - \frac{2(1+T)xy\hbar^2}{1-T+T^2} \right]$$

(Alt) In[*]:= **RVK**[**GST48**]

(Alt) Out[*]= RVK[{Xp[14, 1], Xm[2, 29], Xp[3, 40], Xp[43, 4], Xm[26, 5], Xp[6, 95], Xp[96, 7],
 Xp[13, 8], Xm[9, 28], Xp[10, 41], Xp[42, 11], Xm[27, 12], Xp[30, 15], Xm[16, 61],
 Xm[17, 72], Xm[18, 83], Xp[19, 34], Xm[89, 20], Xm[21, 92], Xm[79, 22], Xm[68, 23],
 Xm[57, 24], Xm[25, 56], Xp[62, 31], Xp[73, 32], Xp[84, 33], Xm[50, 35], Xp[36, 81],
 Xp[37, 70], Xp[38, 59], Xm[39, 54], Xp[44, 55], Xp[58, 45], Xp[69, 46], Xp[80, 47],
 Xp[48, 91], Xp[90, 49], Xp[51, 82], Xp[52, 71], Xp[53, 60], Xm[63, 74], Xm[64, 85],
 Xm[76, 65], Xm[87, 66], Xm[67, 94], Xm[75, 86], Xm[88, 77], Xm[78, 93]},
 {0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
 -1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, -1, 0, 1, 0, 0, 0, 0, 0, 0, -1,
 0, 0, 0, 0, 0, 0, -1, 1, -1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1, -1, 0, 1, 0,
 0, 0, 0, 0, 0, 0, 1, -1, 0, 1, 0, 0, 0, 0, 0, 0, 1, -1, 0, 0, 0, 0, 0}]

(Alt) In[*]:= **Block**[{**\$k** = 1}, **Z**[**GST48**]]

(Alt) Out[*]=
$$\mathbb{E}_{\{\} \rightarrow \{\emptyset\}} \left[\dots 1 \dots, \right.$$

$$\frac{2 a (-1+T) (1+T) (8-14 T+14 T^2-14 T^3+22 T^4-29 T^5+26 T^6-22 T^7+26 T^8-29 T^9+22 T^{10}-14 T^{11}+14 T^{12}-14 T^{13}+8 T^{14}) \hbar}{(-1+2 T-T^2-T^3+2 T^4-T^5+T^8) (-1+T^3-2 T^4+T^5+T^6-2 T^7+T^8)} +$$

$$\left. \frac{\left(\dots 1 \dots \right) \left(\dots 1 \dots \right) \hbar}{\left(\dots 1 \dots \right)^2 \left(\dots 1 \dots \right)} - \frac{2 (1+T) \left(\dots 21 \dots +8 T^{14} \right) x y \hbar^2}{(-1+2 T-T^2-T^3+2 T^4-T^5+T^8) (-1+\dots 7 \dots +T^8)} \right]$$

large output

show less

show more

show all

set size limit...

(Alt) In[*]:= **PrintProfile**[]

```

(Alt) Out[ ]:= ProfileRoot is root. Profiled time: 10512.5
( 2) 15.962/ 10512.500 above Z
( 3) 0.016/ 0.016 above RVK
CF: called 126412 times, time in 5289.54/9986.39
( 1342) 581.982/ 1110.316 under Z
( 90) 0.078/ 0.109 under Boot
( 1164) 3732.591/ 6962.017 under EZip3
( 776) 9.092/ 23.108 under Zip1
( 29856) 424.177/ 800.986 under Zip2
( 93184) 541.624/ 1089.856 under Zip3
( 373473) 4696.848/ 4696.848 above CCF
CCF: called 373473 times, time in 4696.85/4696.85
( 373473) 4696.848/ 4696.848 under CF
EZip3: called 388 times, time in 401.129/7394.59
( 360) 401.099/ 7392.814 under Z
( 28) 0.030/ 1.781 under Boot
( 1164) 3732.591/ 6962.017 above CF
( 388) 13.406/ 31.449 above Zip3
Zip3: called 776 times, time in 80.464/1170.32
( 360) 66.256/ 1136.524 under Z
( 28) 0.802/ 2.347 under Boot
( 388) 13.406/ 31.449 under EZip3
( 93184) 541.624/ 1089.856 above CF
Zip2: called 388 times, time in 20.363/821.349
( 360) 20.019/ 820.023 under Z
( 28) 0.344/ 1.326 under Boot
( 29856) 424.177/ 800.986 above CF
Z: called 2 times, time in 15.962/10512.5
( 2) 15.962/ 10512.500 under ProfileRoot
( 8) 0.079/ 6.594 above Boot
( 1342) 581.982/ 1110.316 above CF
( 360) 401.099/ 7392.814 above EZip3
( 360) 7.314/ 30.267 above Zip1
( 360) 20.019/ 820.023 above Zip2
( 360) 66.256/ 1136.524 above Zip3
Zip1: called 388 times, time in 8./31.108
( 360) 7.314/ 30.267 under Z
( 28) 0.686/ 0.841 under Boot
( 776) 9.092/ 23.108 above CF
Boot: called 28 times, time in 0.19/16.705
( 8) 0.079/ 6.594 under Z
( 20) 0.111/ 10.111 under Boot
( 20) 0.111/ 10.111 above Boot
( 90) 0.078/ 0.109 above CF
( 28) 0.030/ 1.781 above EZip3
( 28) 0.686/ 0.841 above Zip1
( 28) 0.344/ 1.326 above Zip2
( 28) 0.802/ 2.347 above Zip3
RVK: called 3 times, time in 0.016/0.016
( 3) 0.016/ 0.016 under ProfileRoot

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```
(Alt) In[ ]:= Block[{$k = 2}, Z[GST48]]  
PrintProfile[]
```