

Pensieve header: Making table.tex.


In[]:=

```
SetDirectory["C:\\drorbn\\AcademicPensieve\\Talks\\DaNang-1905"];
Once[<< KnotTheory`];
Ribbons = {Knot[0, 1], Knot[6, 1], Knot[8, 8], Knot[8, 9], Knot[8, 20], Knot[9, 27],
  Knot[9, 41], Knot[9, 46], Knot[10, 3], Knot[10, 22], Knot[10, 35], Knot[10, 42],
  Knot[10, 48], Knot[10, 75], Knot[10, 87], Knot[10, 99], Knot[10, 123],
  Knot[10, 129], Knot[10, 137], Knot[10, 140], Knot[10, 153], Knot[10, 155]};
```

ParentDirectory: Argument File should be a positive machine-size integer, a nonempty string, or a File specification. 

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ToFileName: String or list of strings expected at position 1 in ToFileName[{File, WikiLink, mathematica}]. 

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Loading KnotTheory` version of January 20, 2015, 10:42:19.1122.
Read more at <http://katlas.org/wiki/KnotTheory>.

In[]:=

```
CF = Factor;
E[L_, Q_, P_]$_k := E[L, Q, Series[Normal@P, {ε, 0, $k}]];
E_d_r[E[L_, Q_, P_]$_k] := E_d_r@@E[L, Q, P]$_k;
E3@E[ω_, L_, Q_, PS_] := CF /@ E[L, ω^-1 Q, ω^-1 (ω^-4 ε)^(-1+Range@Length@PS).PS]$_k;
E4@E[L_, Q_, P_] := Module[
  {ω = Normal[P]^-1 /. ε → 0, PS = CoefficientList[P, ε]},
  CF /@ E[ω, L, ω Q, ω^-3+4 Range@Length@PS PS]];
E3@E_sp__[as___] := E3@E[as] /. E → E_sp;
E4@E_sp__[as___] := E4@E[as] /. E → E_sp;
```

In[]:=

```
$k = 2;
Clear[QP, ω];
QP[Knot[n_, k_]] := QP[Knot[n, k]] = Collect[Module[{fname},
  fname = "../..//Projects/SL2Invariant/k=2/Data/" <>
  ToString[n] <> "_" <> ToString[k] <> ".m";
  Collect[E3[Get[fname][[2, 2]]][[3]] // Normal, ε, Simplify]
], ε, CF];
ω[K_Knot] := ω[K] = Factor[(QP@K /. ε → 0)^-1];
C_r_d[K_Knot] :=
  Factor[SeriesCoefficient[QP[K], {y, 0, 0}, {ε, 0, k}, {a, 0, d}] ω[K]^(1+2k-d)]
```

In[]:=

```
ρ1p[K_Knot] := ρ1p[K] = Factor[
$$\frac{T(-c_{1,0}[K] + \omega[K] T \partial_T \omega[K])}{(T-1)^2}$$
];
ρ2p[K_Knot] := ρ2p[K] = CF[-2 c_{2,0}[K] + ω[K] c_{2,1}[K]];
plus[ε_] := Expand[ε] /. T → t /. t^n_ /; n < 0 => 0;
```

```
In[ ]:= line = {ω[#], ρ1p[#], ρ2p[#]} & /@ {Knot[3, 1]}
plus /@ line
```

```
Out[ ]:= {{ 1 - T + T^2, 1 + T^2, 3 - 12 T + 26 T^2 - 38 T^3 + 26 T^4 - 12 T^5 + 3 T^6 } / T^3 }
```

```
Out[ ]:= {{ -1 + T, T, -38 + 26 T - 12 T^2 + 3 T^3 } }
```

```
In[ ]:= KnotLine[K_] :=
StringReplace["\\rolcell{n_k}{n^t_{k}}{ω}{ρ1pp}{ρ2pp}{G}{U}{R}{C}", {
  "n" → ToString@K[[1],
  "k" → ToString@K[[2],
  "t" → If[AlternatingQ[K], "a", "n"],
  "ω" → ToString[plus@ω[K], FormatType → TeXForm],
  "ρ1pp" → ToString[plus@ρ1p[K], FormatType → TeXForm],
  "ρ2pp" → ToString[plus@ρ2p[K], FormatType → TeXForm],
  "G" → ToString@ThreeGenus@K,
  "U" → ToString@UnknottingNumber@K,
  "R" → If[MemberQ[Ribbons, K], "\\gY", "\\N"],
  "C" → If[MemberQ[
    {FullyAmphicheiral, NegativeAmphicheiral, ""}, SymmetryType@K], "\\oY", "\\N"]
  ]}]
```

```
In[ ]:= KnotLine /@ AllKnots[{0, 6}]
```

```
Out[ ]:= {\rolcell{0_1}{0^a_1}{1}{0}{0}{0}{0}{\gY}{\oY},
\rolcell{3_1}{3^a_1}{t-1}{t}{3 t^3-12 t^2+26 t-38}{1}{1}{\N}{\N},
\rolcell{4_1}{4^a_1}{3-t}{0}{t^4-3 t^3-15 t^2+74 t-110}{1}{1}{\N}{\oY},
\rolcell{5_1}{5^a_1}{t^2-t+1}{2 t^3+3 t}{5 t^7-20 t^6+55 t^5-120
t^4+217 t^3-338 t^2+450 t-510}{2}{2}{\N}{\N}, \rolcell{5_2}{5^a_2}{2
t-3}{5 t-4}{-10 t^4+120 t^3-487 t^2+1054 t-1362}{1}{1}{\N}{\N},
\rolcell{6_1}{6^a_1}{5-2 t}{t-4}{14 t^4-16 t^3-293 t^2+1098 t-1598}{1}{1}{\gY}{\N},
\rolcell{6_2}{6^a_2}{-t^2+3 t-3}{t^3-4 t^2+4 t-4}{3 t^8-21 t^7+49
t^6+15 t^5-433 t^4+1543 t^3-3431 t^2+5482 t-6410}{2}{1}{\N}{\N},
\rolcell{6_3}{6^a_3}{t^2-3 t+5}{0}{4 t^8-33 t^7+121 t^6-203
t^5-111 t^4+1499 t^3-4210 t^2+7186 t-8510}{2}{1}{\N}{\oY}}
```

```
In[*]:= Make[range_] := Make[range, 2];
Make[range_, col_] := StringJoin@@Table[
  StringJoin[StringJoin@@Riffle[L, " &\n"], " \\\n\\hline\n"],
  {L, Partition[KnotLine /@ AllKnots[range], UpTo@col]}
];
Make[{0, 6}, 3]
```

```
Out[*]:= \rolcell{0_1}{0^a_{1}}{1}{0}{0}{0}{0}{\gY}{\oY} &
\rolcell{3_1}{3^a_{1}}{t-1}{t}{3 t^3-12 t^2+26 t-38}{1}{1}{\N}{\N} &
\rolcell{4_1}{4^a_{1}}{3-t}{0}{t^4-3 t^3-15 t^2+74 t-110}{1}{1}{\N}{\oY} \\\
\hline
\rolcell{5_1}{5^a_{1}}{t^2-t+1}{2 t^3+3 t}{5 t^7-20
  t^6+55 t^5-120 t^4+217 t^3-338 t^2+450 t-510}{2}{2}{\N}{\N} &
\rolcell{5_2}{5^a_{2}}{2 t-3}{5 t-4}{-10 t^4+120
  t^3-487 t^2+1054 t-1362}{1}{1}{\N}{\N} &
\rolcell{6_1}{6^a_{1}}{5-2 t}{t-4}{14 t^4-16 t^3-293
  t^2+1098 t-1598}{1}{1}{\gY}{\N} \\\
\hline
\rolcell{6_2}{6^a_{2}}{-t^2+3 t-3}{t^3-4 t^2+4 t-4}{3 t^8-21
  t^7+49 t^6+15 t^5-433 t^4+1543 t^3-3431 t^2+5482 t-6410}{2}{1}{\N}{\N} &
\rolcell{6_3}{6^a_{3}}{t^2-3 t+5}{0}{4 t^8-33 t^7+121 t^6-203
  t^5-111 t^4+1499 t^3-4210 t^2+7186 t-8510}{2}{1}{\N}{\oY} \\\
\hline
```

```
In[*]:= DeleteFile["table1.tex"];
WriteString["table1.tex", Make[{0, 8}, 3]];
Close["table1.tex"]
```

```
Out[*]:= table1.tex
```

```
In[*]:= DeleteFile["table2.tex"];
WriteString["table2.tex", Make[{9, 10}, 2]];
Close["table2.tex"]
```

DeleteFile: Directory or file table2.tex not found.



```
Out[*]:= table2.tex
```