

Pensieve header: Making table.tex.

```
In[ ]:= SetDirectory["C:\\drorbn\\AcademicPensieve\\Talks\\Toronto-1811"];
Once[<< KnotTheory`];
tab = Join[{Knot[0, 1] -> {0., E[1, 0, 0, 0]}}, Get["../2016-09/tab.m"]];
tab /. (K_ -> {_, z_}) -> (z1[K] = z);
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]};
```

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

```
In[ ]:= z1[Knot[3, 1]]
```

$$\text{Out[]} = \mathbb{E} \left[-1 + \frac{1}{t} + t, 0, 0, \right. \\ \left. 16 + \frac{9c}{2} + \frac{2}{t^4} - \frac{2c}{t^4} - \frac{7}{t^3} + \frac{11c}{2t^3} + \frac{14}{t^2} - \frac{8c}{t^2} - \frac{18}{t} + \frac{4c}{t} - 10t - 10ct + 4t^2 + 8ct^2 - t^3 - \frac{3ct^3}{2} - 2ct^4 + \right. \\ \left. 2ct^5 - \frac{ct^6}{2} - 4uw + \frac{2uw}{t^4} - \frac{7uw}{2t^3} + \frac{9uw}{2t^2} + \frac{uw}{2t} + 6t uw - 2t^2 uw - \frac{1}{2}t^3 uw + \frac{3}{2}t^4 uw - \frac{1}{2}t^5 uw \right]$$

```
In[ ]:= al[K_] := z1[K][[1]];
ap[K_] := al[K] /. t^n_ -> 0; n < 0 -> 0;
```

```
In[ ]:= al /@ AllKnots[{0, 5}]
```

$$\text{Out[]} = \{1, -1 + \frac{1}{t} + t, 3 - \frac{1}{t} - t, 1 + \frac{1}{t^2} - \frac{1}{t} - t + t^2, -3 + \frac{2}{t} + 2t\}$$

```
In[ ]:= ap /@ AllKnots[{0, 5}]
```

$$\text{Out[]} = \{1, -1 + t, 3 - t, 1 - t + t^2, -3 + 2t\}$$

```
In[ ]:= e[K_] := Expand[Together[
  (t z1[K][[4]] /. c | u | w -> 0) + al[K]^3 t^2 D[al[K], t]
]];
ep[K_] := e[K] /. t^n_ -> 0; n < 0 -> 0;
```

```
In[ ]:= Table[K -> e[K], {K, AllKnots[{3, 10}]}] >> etab.m
```

```
In[ ]:= ep /@ AllKnots[{0, 5}]
```

$$\text{Out[]} = \{0, t, 0, 3t + 2t^3, -4 + 5t\}$$

```
In[ ]:= SymmetryType /@ AllKnots[{0, 10}] // Union
```

KnotTheory: The symmetry type data known to KnotTheory` is taken from Charles Livingston's <http://www.indiana.edu/~knotinfo/> +

KnotTheory: Loading precomputed data in IndianaData` +

$$\text{Out[]} = \{, \text{Chiral}, \text{FullyAmphicheiral}, \text{NegativeAmphicheiral}, \text{Reversible}\}$$

```
In[ ]:= KnotLine[K_] := StringReplace["\\rolcell{n_k}{n^t_{k}}{ap}{ep}{G}{U}{R}{C}", {
  "n" → ToString@K[[1]],
  "k" → ToString@K[[2]],
  "t" → If[AlternatingQ[K], "a", "n"],
  "ap" → ToString[ap[K], FormatType → TeXForm],
  "ep" → ToString[ep[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}]
```

 KnotTheory: Loading precomputed data in PD4Knots` 

```
Out[ ]:= {\rolcell{0_1}{0^a_1}{1}{0}{0}{0}{\gY}{\oY},
  \rolcell{3_1}{3^a_1}{t-1}{t}{1}{1}{\N}{\N},
  \rolcell{4_1}{4^a_1}{3-t}{0}{1}{1}{\N}{\oY},
  \rolcell{5_1}{5^a_1}{t^2-t+1}{2 t^3+3 t}{2}{2}{\N}{\N},
  \rolcell{5_2}{5^a_2}{2 t-3}{5 t-4}{1}{1}{\N}{\N},
  \rolcell{6_1}{6^a_1}{5-2 t}{t-4}{1}{1}{\gY}{\N},
  \rolcell{6_2}{6^a_2}{-t^2+3 t-3}{t^3-4 t^2+4 t-4}{2}{1}{\N}{\N},
  \rolcell{6_3}{6^a_3}{t^2-3 t+5}{0}{2}{1}{\N}{\oY}}
```

```
In[ ]:= Make[n_] := Make[n, 2];
Make[n_, k_] := StringJoin@@ Table[
  StringJoin[StringJoin@@ Riffle[L, "&n"], " \\ \\ \\n \\hline\n"],
  {L, Partition[KnotLine /@ AllKnots[{0, n}], UpTo@k]}
];
Make[6, 3]
```

```
Out[ ]:= \rolcell{0_1}{0^a_1}{1}{0}{0}{0}{\gY}{\oY} &
  \rolcell{3_1}{3^a_1}{t-1}{t}{1}{1}{\N}{\N} &
  \rolcell{4_1}{4^a_1}{3-t}{0}{1}{1}{\N}{\oY} \\
  \hline
  \rolcell{5_1}{5^a_1}{t^2-t+1}{2 t^3+3 t}{2}{2}{\N}{\N} &
  \rolcell{5_2}{5^a_2}{2 t-3}{5 t-4}{1}{1}{\N}{\N} &
  \rolcell{6_1}{6^a_1}{5-2 t}{t-4}{1}{1}{\gY}{\N} \\
  \hline
  \rolcell{6_2}{6^a_2}{-t^2+3 t-3}{t^3-4 t^2+4 t-4}{2}{1}{\N}{\N} &
  \rolcell{6_3}{6^a_3}{t^2-3 t+5}{0}{2}{1}{\N}{\oY} \\
  \hline
```

```
In[ ]:= DeleteFile["table.tex"];
WriteString["table.tex", Make[8, 3]];
Close["table.tex"]
```

```
Out[ ]:= table.tex
```