

APPENDICES

KNOTS UP TO 7 CROSSINGS

Conjugates, where different are not shown separately. The table shows the Alexander Number, Group and Polynomial.

0 crossings:

K0.1 (Trivial knot)

Alexander Number = 1

Alexander Group = 1

Alexander Polynomial = 1



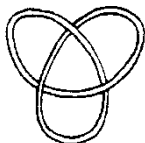
3 crossings:

K3.1 (Trefoil knot) PRIME

3

\mathbb{Z}_3

$\lambda^2 - \lambda + 1$



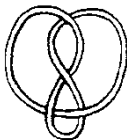
4 crossings:

K4.1 (Figure 8 knot) prime

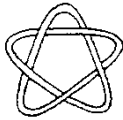
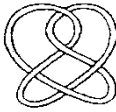
5

\mathbb{Z}_5


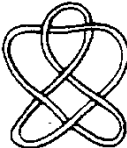
$\lambda^2 - 3\lambda + 1$

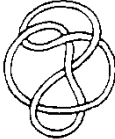




5 crossings:

<p>K5.1 (Cinquefoil knot) prime 5 \mathbb{Z}_5 $\lambda^4 - \lambda^3 + \lambda^2 - \lambda + 1$</p> 	<p>K5.2 (Three-twist knot) prime 7 \mathbb{Z}_7 $2\lambda^2 - 3\lambda + 2$</p> 
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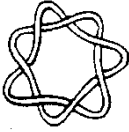
6 crossings:

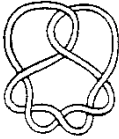

<p>K6.1 (Stevedore knot) prime 9 \mathbb{Z}_9 $2\lambda^2 - 5\lambda + 2$</p> 	<p>K6.2 prime 11 \mathbb{Z}_{11} $\lambda^4 - 3\lambda^3 + 3\lambda^2 - 3\lambda + 1$</p> 
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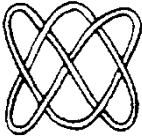
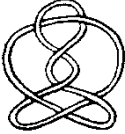
<p>K6.3 prime 13 \mathbb{Z}_{13} $\lambda^4 - 3\lambda^3 + 5\lambda^2 - 3\lambda + 1$</p> 
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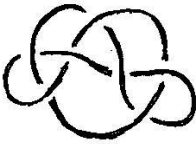
<p>K6.5 (Square knot) $= 3.1 + 3.1$ 9 $\mathbb{Z}_3 \oplus \mathbb{Z}_3$</p> 	<p>K6.4 (Granny knot) $= 3.1 + \overline{3.1}$ 9 $\mathbb{Z}_3 \oplus \mathbb{Z}_3$</p> 
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7 crossings:

<p>K7.1 prime 7 \mathbb{Z}_7 $\lambda^6 - \lambda^5 + \lambda^4 - \lambda^3$ $+ \lambda^2 - \lambda + 1$</p>	
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<p>K7.2 prime 11 \mathbb{Z}_{11} $3\lambda^2 - 5\lambda + 3$</p>		<p>K7.3 prime 13 \mathbb{Z}_{13} $2\lambda^4 - 3\lambda^3 + 3\lambda^2 - 3\lambda + 2$</p>	
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<p>K7.4 prime 15 \mathbb{Z}_{15} $4\lambda^2 - 7\lambda + 4$</p>		<p>K7.5 prime 17 \mathbb{Z}_{17} $2\lambda^4 - 4\lambda^3 + 5\lambda^2 - 4\lambda + 2$</p>	
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<p>K7.6 prime 19 \mathbb{Z}_{19} $\lambda^4 - \lambda^3 + 7\lambda^2 - 5\lambda + 1$</p>		<p>K7.7 prime 21 \mathbb{Z}_{21} $\lambda^4 - 5\lambda^3 + 9\lambda^2 - 5\lambda + 1$</p>	
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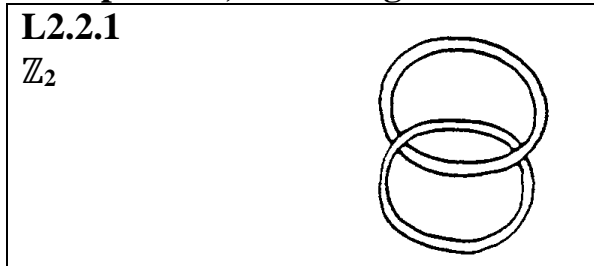
K7.8 $= 5.1 + 3.1$ 15 \mathbb{Z}_{15} $\lambda^4 - 4\lambda^3 + 5\lambda^2 - 4\lambda + 1$	K7.9 $= 5.1 + \overline{3.1}$ 15 \mathbb{Z}_{15} $\lambda^4 - 4\lambda^3 + 5\lambda^2 - 4\lambda + 1$
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Up to seven crossings prime knots are alternating, have cyclic Alexander groups, have Alexander polynomials with alternating signs and with the absolute values of the coefficients increasing from the ends to the middle. From eight crossings on, these properties hold for the majority of prime knots, but not all.

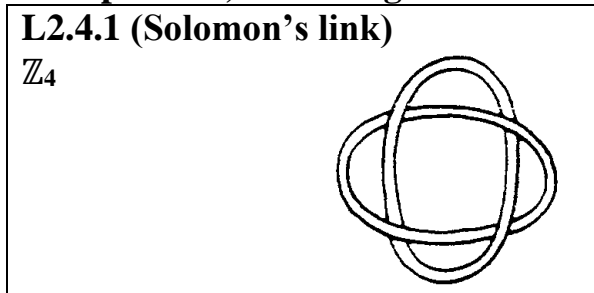
LINKS UP TO 7 CROSSINGS

This excludes knots and disjoint unions.
The table provides the Alexander Group.

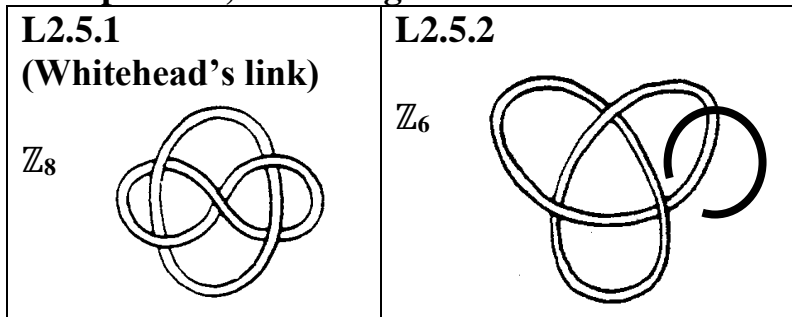
2 components, 2 crossings:



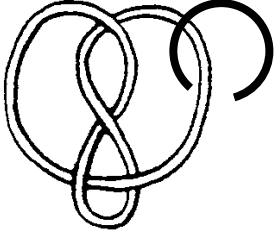
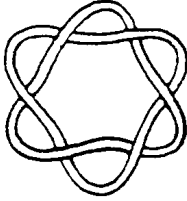
2 components, 4 crossings:

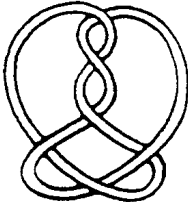



2 components, 5 crossings:

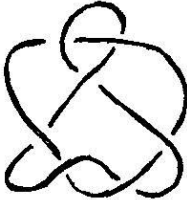
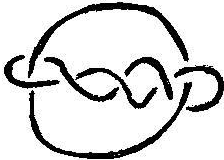


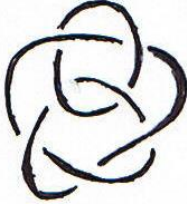
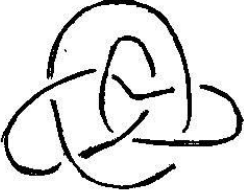
2 components, 6 crossings:

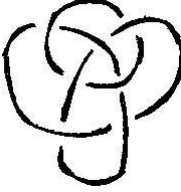
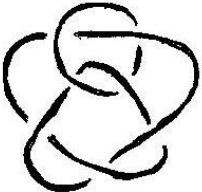
<p>L2.6.1</p> <p>\mathbb{Z}_{10}</p> 	<p>L2.6.2</p> <p>\mathbb{Z}_6</p> 
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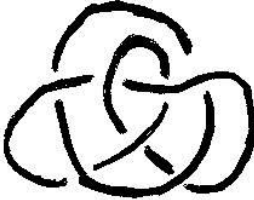
<p>L2.6.3</p> <p>\mathbb{Z}_{10}</p> 	<p>L2.6.4</p> <p>\mathbb{Z}_{12}</p> 
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2 components, 7 crossings:

<p>L2.7.1</p> <p>\mathbb{Z}_{14}</p> 	<p>L2.7.2</p> <p>\mathbb{Z}_{16}</p> 
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<p>L2.7.3 \mathbb{Z}_4</p> 	<p>L2.7.4 \mathbb{Z}_{20}</p> 
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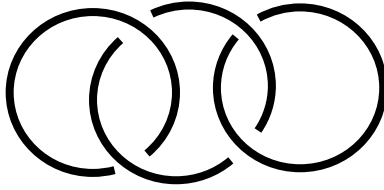
<p>L2.7.5 \mathbb{Z}_{24}</p> 	<p>L2.7.6 \mathbb{Z}_2</p> 
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<p>L2.7.7 \mathbb{Z}_{10}</p> 
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3 components, 4 crossings:

L3.4.1

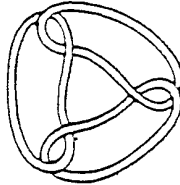
$$\mathbb{Z}_2 \oplus \mathbb{Z}_2$$



3 components, 6 crossings

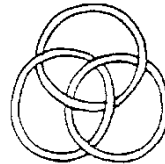
L3.6.1

$$\mathbb{Z}_2 \oplus \mathbb{Z}_6$$



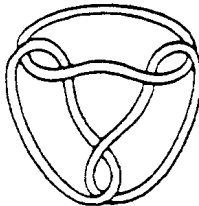
L3.6.2

$$\mathbb{Z}_4 \oplus \mathbb{Z}_2$$



L3.6.3

$$\mathbb{Z}_2 \oplus \mathbb{Z}_2$$



3 components, 7 crossings

L3.7.1

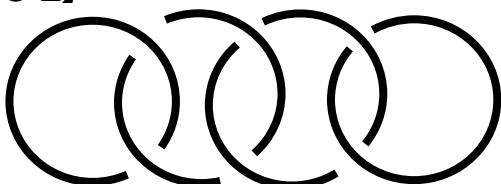
\mathbb{Z}_2



4 components, 6 crossings:

L4.6.1

$\mathbb{Z}_2 \oplus \mathbb{Z}_2$



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LIST OF TITLES

GENERAL

- The Mathematics At The Edge Of The Rational Universe

ELEMENTARY

- Basic Mathematics
- Concepts of Algebra
- Concepts of Calculus

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- Techniques of Calculus
- Matrices

2nd YEAR UNI

- Linear Algebra
- Languages & Machines
- Discrete Mathematics

3rd YEAR UNI

- Group Theory vol 1
- Group Theory vol 2
- Galois Theory
- Geometry vol 1
- Geometry vol 2
- Topology
- Set Theory
- Number Theory
- Graph Theory
- Complex Variables

POSTGRADUATE

- Ring Theory
- Representation Theory
- Quadratic Forms
- Group Tables vol 1
- Group Tables vol 2