Definitions

The u-v-w Story

<table>
<thead>
<tr>
<th>n-Knots</th>
<th>v-Knots</th>
<th>w-Knots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordinary (usual) knot: objects in 3D — knots, links, tangles, knots, links, etc.</td>
<td>Virtual knots: objects in 4D — virtual knots, virtual links, virtual tangles</td>
<td>Ribbon knots: objects in 5D — ribbon knots, ribbon links, ribbon tangles</td>
</tr>
</tbody>
</table>

Topology

Chord diagrams and Jacobi diagrams, modulo 4T, STU, IHX, etc.

Losey diagrams and Jacobi diagrams, modulo 4T, STU, IHX, etc.

Finite dimensional Lie bialgebra, representations, and associated spaces.


High Algebra, Low Algebra, Combinatorics

Some Propaganda

"God created the laws, all else is the work of mortals."

Leopold Kronecker

The following tables show \( \dim V_n \) and \( \dim W_n \) for \( n = 1, \ldots, 5 \), for 18 classes of v-Knots:

<table>
<thead>
<tr>
<th>n</th>
<th>( \dim V_n )</th>
<th>( \dim W_n )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1, 1</td>
<td>0, 0</td>
</tr>
<tr>
<td>2</td>
<td>1, 1, 1, 1</td>
<td>0, 0, 0, 0</td>
</tr>
<tr>
<td>3</td>
<td>1, 1, 1, 1, 1</td>
<td>0, 0, 0, 0, 0</td>
</tr>
</tbody>
</table>

Conjectures

18 Conjectures

Four non-trivial v-Knots: R1, R2, R2c, R3.

Comments

Technique

Add a "composition" with a table.
$V_n = (V^n / I^{n+1})^*$ is one thing we measure...

$V_n / V_{n-1} = (I^n / I^{n+1})^*$

$\mathbb{R}_n \rightarrow \mathcal{D}_n = \frac{\text{arrow diagrams}}{\text{exact}} \frac{I^n \rightarrow X = \cdots \rightarrow I^{n+1}}{	ext{exact}}$

$\mathbb{R}^H = \left\{ \begin{array}{c}
R1 \rightarrow \\
R2L \rightarrow \\
R2C \rightarrow \\
R3B \rightarrow \\
X \rightarrow X \rightarrow 
\end{array} \right\}$

$\mathcal{D}_n \rightarrow V_n = (\mathcal{D}_n / \mathbb{R}_n)^*$ is the other thing we measure

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The Polynak Technique:

\[ v^k = CA^k(\mathbb{X}, \mathbb{X}) \big/ \mathcal{R}^0 = \begin{cases} \text{etc.} \\
\end{cases} \]

\[ \mathfrak{v} = \text{result of Poly} \]