### Links. Reidemeister theorem

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Figure : Hopf link, Whitehead link and Borromeo rings



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Figure : Locking carabines is unsafe

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# Knot diagrams



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#### Figure : Singularities of projections

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Can we change the diagram to get all possible projections of all possible positions of the knot in  $\mathbb{R}^3$ ?

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Figure : Reidemeister moves

## Why these moves?



Figure : Reidemeister moves and singularities

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Figure : Reidemeister moves and singularities

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#### How to use the moves?



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#### Theorem

Two knots are equivalent **if and only if** a diagram of the first knot can be transformed into a diagram of the second knot by a finite sequence of Reidemeister moves and trivial moves.

#### Is that even allowed?!



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**Theorem.** The number of good colorings of a knot diagram is a knot invariant.

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Figure : Invariance under Reidemeister moves



Figure : Find the number of good colorings of these knots