

# Formalization of mathematics

Yury Kudryashov

Nov 23, 2023

Guess how many of the following theorems have proofs formalized in a computer-verifiable format.

1.  **Banach–Schauder open mapping theorem:** a surjective continuous linear operator between two Banach spaces is an open map.
2.  **Birkhoff Ergodic Theorem.**
3.  Both the **Mandelbrot set** and its complement are **connected sets**.
4.  **Cauchy-Kovalevskaya Theorem** on existence of an analytical solution of an analytical PDE.
5.  **Denjoy’s theorem:** a  $C^{1+\nu b}$  orientation-preserving diffeomorphism of the circle with an irrational rotation number is conjugate to a rotation.
6.  **Eversion of the sphere:** the identity embedding of the 2-sphere is isotopic to the embedding  $x \mapsto -x$ .
7.  A locally compact Hausdorff topological group admits a **Haar measure**.
8.  Existence of a **smooth partition of unity**.
9.  **Feit–Thompson theorem:** every finite group of odd order is solvable.
10.  **Fermat’s Last Theorem.**
11.  **Four colors theorem:** the chromatic number of a planar graph is at most 4.
12.  **Galois correspondence.**
13.  **Herman-Yoccoz theorem** on linearization of a circle diffeomorphism.
14.  **Jordan curve theorem.**
15.  **Liouville theorem:** a complex differentiable bounded function is a constant.
16.  **Nullstellensatz.**
17.  **Picard-Lindelöf (Cauchy-Lipschitz) Theorem** on existence and uniqueness of a solution of an ordinary differential equation.
18.  **Poincaré-Bendixson Theorem.**
19.  **Poincaré recurrence theorem.**
20.  **Sard’s Theorem.**
21.  The **continuum hypothesis** is independent of **ZFC**.

Total: \_\_\_\_\_