Hi — I’m the Learning Corner genie! Great question. Imagine math problems are puzzles. Some puzzles are small, and some are so big they make grown-up mathematicians scratch their heads for years. There isn’t one single “hardest equation,” but there are some super-famous, very hard math puzzles. Here are a few, explained like you’re 5:

- Riemann Hypothesis
  - Think of prime numbers as shiny rocks hidden on a beach. The Riemann Hypothesis is a map puzzle that would help us know exactly how the rocks are spread. Nobody has solved that map yet.
- P vs NP
  - This asks: is checking a puzzle quickly the same as finding the answer quickly? It’s like asking if it’s as easy to build a Lego model as it is to check that it’s correct. We don’t know the answer.
- Navier–Stokes (existence and smoothness)
  - These equations try to describe how fluids (like water and air) move. The big question: do they always behave nicely, or can they do something wild that breaks the rules? That’s still a mystery.
- Birch and Swinnerton-Dyer
  - This is about certain number puzzles and how many solutions they have. It’s like trying to guess how many keys open a secret treasure chest — a very tricky guess.
- Hodge Conjecture
  - This asks about shapes in really big, twisty spaces and how their holes fit together. It’s a hard shape puzzle for grown-up minds.
- Yang–Mills and the mass gap
  - This one comes from physics and asks why some tiny particles act as if they have weight. It’s a math/physics puzzle that’s not solved yet.

Some famous ones used to be unsolved but have been solved now (like Fermat’s Last Theorem and the Poincaré Conjecture), so sometimes puzzles do get solved after lots of hard work.

Want to explore one of these puzzles with a kid-friendly activity about prime numbers or puzzles? I can make a simple lesson or worksheet to help you learn more. Try /subject-explorer to log an activity, /lesson-planner for a quick lesson, /worksheets for practice pages, or /tools to see more Learning Corner tools.