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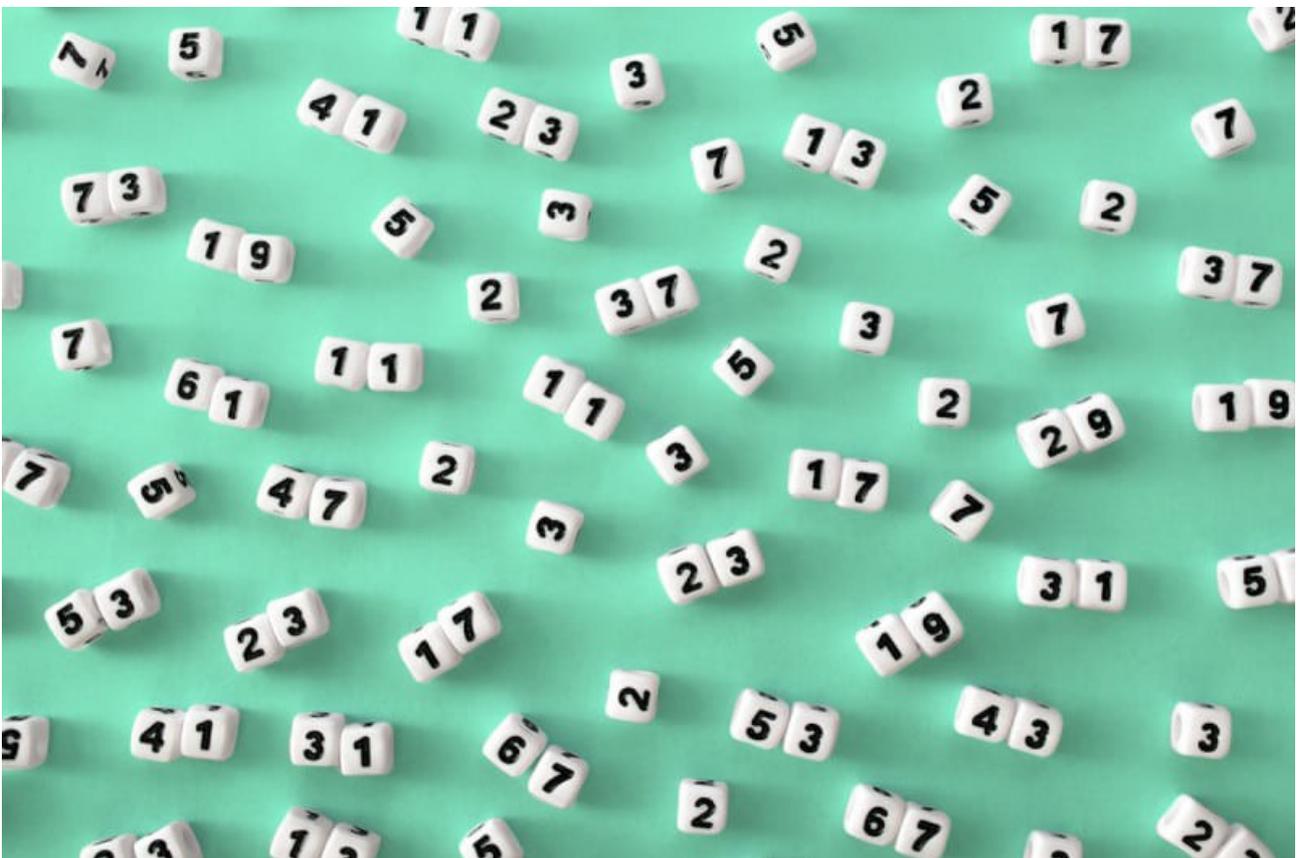
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Mathematicians must be more prepared to test their truths

Mathematical proofs embody a Platonic ideal of eternal truth. Two major contested proofs this week show the need for more controversy, not less



Robert Brook/Science Photo Library

IT IS a truism that science is not true. A scientific theory is merely our best guess at truth, backed up by evidence, but waiting to be overturned by something better. Copernicus rewrote Ptolemy; Einstein picked holes in Newton; Darwin overturned pre-existing stories of our origins.

Mathematics is different. Theorems proved by the ancient Greeks remain as true as ever. Pythagoras's theorem about the three sides of a right-angled triangle works, will always work and won't be improved.

It is a Platonic ideal of truth (another Greek, of course). But two incidents this week demonstrate that truth is sometimes out of reach in the mathematical world too.

On Monday, eminent UK mathematician Michael Atiyah presented a claimed proof of the Riemann hypothesis, one of the most difficult open problems in mathematics (see "[Riemann hypothesis likely remains unsolved despite claimed proof](#)"). Atiyah is certain he has cracked it. Most mathematicians disagree, but decline to say so in public for fear of embarrassing him.

This proof was only a brief sketch, so at the very least will require a lot of fleshing out. Brevity was not the problem with the second contested proof in the spotlight this week. In 2012, Shinichi Mochizuki claimed a solution to the ABC conjecture, another long-standing puzzle, in a 500-page paper so dense that his peers have argued ever since over whether it is correct. Until now, few would commit to a public confrontation (see "[Infinity war: The ongoing battle over the world's hardest maths proof](#)").

Mathematicians are a generally genteel lot, so such a dual controversy is a rare occurrence that surely merits statistical investigation. Barring a divine oracle to hand down judgement, a proof can only be found true if a majority of mathematicians deem it sufficiently rigorous. Perhaps we need a few more to stick their heads above the parapet.

This article appeared in print under the headline "Universal truth, contested"

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