# When is a proof not a proof?

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(To the tune of "As time goes by" from Casablanca)

You must remember this

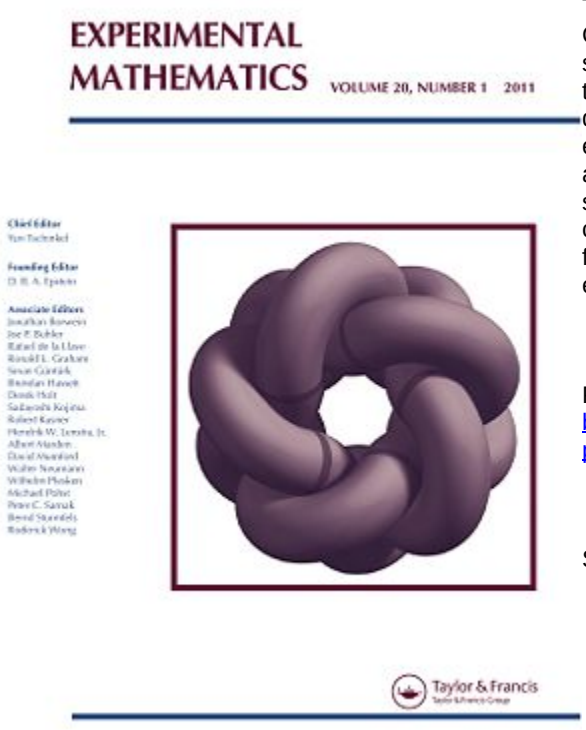
A proof is not a proof

A conjecture is not a conjecture

The fundamental things apply

As pure math goes by

The late William Thurston helped bring about " The Death of Proof " (Scientific American Blog). You might say that there is a lot of math that can be proved, and maybe if if can't be proved, its not math!




That is true and it depends what you mean by "proved". In Godel's theory most of math can not be formally proved in systems that do not contain contradictions themselves... so are those proofs valid? We act as though they are... And how is this different from physics where it is all conjecture based on experimental evidence and if a new set of experiments comes along that break the old theory we bring in new ones. There is a school of experimental math that works a similar way using computer programs to both create experimental data and to do formal proofs of the conjectures. They even have a journal about experimental math now, so it is getting quiet popular.

Prof Doron Zeilberger in his provocative essay says that proving by computer programming gives more understanding than proving by hand

Some of the experiments in math even become art