

request for ideas

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I am planning to write a paper which surveys mathematical results that show that the old "axiom→proof→theorem" way of doing mathematics does not always yield complete information about mathematics. The prime example of this (which started it all) is Godel's Incompleteness Theorem, but there has been a lot of work in this area since then.

For instance, Gregory Chaitin has an incompleteness theorem which shows conclusively that a certain number which he calls Omega, which is really the probability that a computer program halts (defined in a way that makes sense), is a random number – which implies that there is no finite axiom system that can yield all of the bits of Omega. He concludes from all of his work that sometimes one has to simply perform experiments in mathematics and form conclusions from the experiments without being absolutely certain that the conclusions are correct.

It is these types of very original ideas that I am looking for to put in my paper, that there are some problems out there that are so difficult for us to get a grip on that we might have to approach them like a chemist approaches chemistry, never being 100% sure that his or her theories are always correct.

Anyone who knows of results like these or has done work in this area or has original ideas is welcome to respond to me on usenet or if you want, you can email me directly.

Craig