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Jeff Buechner* (buechner@rci.rutgers.edu), Dept Philosophy, 432 Conklin Hall, 175 University Ave., Rutgers University, Newark, NJ 07102. *Formal mathematical proof and mathematical practice: a new skeptical problem*. Preliminary report.

There are several problems in the philosophy of mathematics concerning the notion of mathematical proof, at least one of which serves as the primary motivation for experimental mathematics. But there is a new problem which appears to have no easy fix; moreover, it is a skeptical problem. The problem is that one can construct a proof (in some cases by an algorithm) which conforms to the definition of a formal mathematical proof, which no mathematician would regard as a legitimate mathematical proof. Indeed, there are some constructions that even a layman with no knowledge of mathematics would regard as an illegitimate mathematical proof. Appeal to the informal notion of proof used by mathematicians is circular: to justify the formal notion, one needs to appeal to the informal notion, which, in turn, is justified in terms of the formal notion. The skeptical problem is: which proofs are genuine and provide mathematical knowledge, and which do not? It is worthless to appeal to the notion of a formal mathematical proof to resolve the skeptical issue. (Received September 12, 2011)