

Re: Formalizing the Fundamental Theorem of Arithmetic

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On 2007-05-24, in sci.logic, george wrote:

In other words, the best answer to the original question is another question, namely, "What is the most natural and straightforward encoding of a multiset of natural numbers as a natural number"? And you DON'T get to say "the product of multiplying the nth prime to the mth power for every n in the multiset" -- that is precisely the encoding we are trying to INVERT (i.e., if you do that, then every number's prime factorization is best represented by the number that is ITSELF; somehow I DOUBT that that COULD COUNT as "a proof of the fundamental theorem of arithmetic").

Under some coding schemes the fundamental theorem of arithmetic does indeed come out as a triviality, the formal proof of which has nothing to do with its proof in the ordinary sense. This is an illustration of the fact that when formalizing mathematics we must exercise our judgment and good sense to decide whether the formalization captures the aspects of ordinary mathematical reasoning we find relevant.

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"Wovon man nicht sprechen kann, darüber muss man schweigen"
– Ludwig Wittgenstein, Tractatus Logico-Philosophicus