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Roger A Simons* (rsimons@ric.edu), Dept. of Math/CS, Rhode Island College, Providence, RI 02908. *What Is a Mathematical Entity?* Preliminary report.

This and the related question of what is mathematics have been discussed by philosophers throughout recorded history. Many philosophies have been proposed. But none of them adequately answered the question of what mathematical objects are. They are patterns according to a view espoused by Lynn Steen, Peter Hilton, and others. I will embellish on that position. I think mathematical entities are certain patterns, relationships, classifications, and organizing schemes. They may be quantitative, organizational, diagrammatic, spatial, or temporal. They are the denotations of concepts. Elementary patterns like the pairing pattern underlie elementary mathematical concepts like doubleton sets and the number 2. There are many such patterns which are readily observable. But many more patterns and organizing schemes are quite complex and may be beyond what most human minds can observe. For example, the pattern that denotes a Lie group was probably never observed by Stone-Age people. A mind that can observe such a pattern might be one we would characterize as having great mathematical insight or intuition. In modern times, we discover most of these subtle patterns by our development of mathematical theorems, and we learn about the properties of such things by proving them. (Received September 17, 2000)