Mathematical language, logic, and proof

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This talk will include discussion of

- how mathematical symbolism is used to express mathematical thoughts;
- how the same symbols can be used to discuss both numbers and higher-level concepts;
- how the written language both discusses and helps conceptualize the concepts of higher-level mathematics (so higher-level concepts and the language are developed simultaneously);
- the difficulties students have in interpreting what mathematical sentences really say, and the reasons for those difficulties;
- what needs to be taught to help students advance conceptually;
- what needs to be taught to help students read with full comprehension;
- the minimum amount of logic students need to read and write proofs;
- the logic that helps students create and organize most proofs; and lastly,
- a way to teach all that!