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Richard E. Hodel* (hodel@math.duke.edu), Box 90320, Mathematics Department, Duke University, Durham, NC 27708. *Matroid theory, topology, logic: What do they have in common?*

Fundamental concepts in each of the above branches of mathematics can be axiomatized in terms of a closure operator that satisfies certain additional conditions. We take a slightly different approach by using a consequence relation (taken from logic) and denoted by δ (taken from topology). Informally, $x \delta A$ states that x is near A . Here is a preview of the way this is interpreted in various settings:

linear algebra: the vector x is a linear combination (or an affine combination) of vectors in A . graph theory: x is a edge with vertices u and v and there is a path $P \subset A$ that joins u and v . topology: x is in A or x is a limit point of A . logic: statement x follows for the axiom system A by the laws of logic.

We prove theorems that apply to all three branches and also give examples and theorems in each specific area. For example, in topology we focus on the question "When do countable sets suffice?" Cryptomorphisms are emphasized throughout. (Received July 31, 2011)