Studies in Linguistics and Philosophy

Mathematical Methods in Linguistics

by

BARBARA H. PARTEE, ALICE TER MEULEN
AND ROBERT E. WALL

This new textbook provides a broad introduction to mathematical methods which find important linguistic applications. It provides at least a basic mathematical background for undergraduate and graduate students in theoretical linguistics with no prior mathematical experience beyond high school, and offers others an elementary introduction to some topics not routinely covered in mathematics courses.

Elementary set theory accustoms the students to mathematical abstraction, includes the standard constructions of relations, functions, and orderings, and leads to a discussion of the various orders of infinity. The material on logic covers not only the standard statement logic and first-order predicate logic but includes an introduction to formal systems, axiomatization, and model theory. The section on algebra is presented with an emphasis on lattices as well as Boolean and Heyting algebras. Background for recent research in natural language semantics includes sections on lambda-abstraction and generalized quantifiers. Chapters on automata theory and formal languages contain a discussion of languages between context-free and context sensitive and form the background for much current work in syntactic theory and computational linguistics. The many exercises not only reinforce basic skills but offer an entry to linguistic applications of mathematical concepts.

Audience

Upper-level undergraduate students and graduate students in theoretical linguistics. Computer-science students with interests in computational linguistics, logic programming and Artificial Intelligence. Mathematicians and logicians with interests in linguistics and the semantics of natural language.

KLUWER ACADEMIC PUBLISHERS   SLAP 30

Studies in Linguistics and Philosophy

Barbara H. Partee,
Alice ter Meulen and Robert E. Wall

Mathematical Methods in Linguistics

Kluwer Academic Publishers