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First order categorical logic, by Michael Makkai and Gonzalo E. Reyes, Lecture Notes in Math., vol. 611, Springer-Verlag, Berlin, Heidelberg, New York, 1977, viii + 301 pp. $14.30.

The authors obtained new proofs for theorems of Barr and Deligne concerning topoi, and also obtained some basic new results in this area. Their proofs are applications of standard results and techniques of logic. Since the relationships between logic and category theory at this relatively deep level are not widely known, they wisely decided to give a general and self-contained explanation of these relationships in addition to their proofs and results. The resulting work, despite its unfinished character typical of the lecture notes series, should hence be, at least in part, of considerably wider interest than a research paper on these results would have been.

Before describing briefly the contents of the book, it is desirable to make some remarks on the role of categorical logic in mathematics. Categorical logic may be described as one of the algebraic ways of looking at logic. Algebraic logic arose, in part at least, from trying to conceive of logical notions and theorems in terms of universal algebraic concepts. Thus polyadic algebras (see Halmos [**Hal**]) and cylindric algebras (see Henkin, Monk, Tarski [**HMT**]) are algebraic versions of logic, and are algebraic structures (certain Boolean algebras with operators) which can be, and have been, studied in much the same way that one studies groups, rings, lattices, etc. At the same time that algebraic logic in this sense has been developing, category theory also developed, and in particular many facets of universal algebra were generalized (see Mac Lane [**Mc L**]). The interplay between category theory and logic may be considered to be another algebraization of logic. The present book gives one of the first systematic treatments of this kind of algebraization.