THE

JOURNAL OF

SYMBOLIC LOGIC

EDITED BY

ALONZO CHURCH BURTON S. DREBEN

HERBERT ENDERTON C. E. M. YATES DAGFINN FØLLESDAL CARL G. JOCKUSCH

ANIL NERODE

Managing Editor: ALFONS BORGERS

Consulting Editors:

YEHOSHUA BAR-HILLEL C. A. BAYLIS JIŘÍ BEČVÁŘ JONATHAN F. BENNETT PAUL BERNAYS ANDRZEJ BLIKLE C. C. CHANG WILLIAM CRAIG MARTIN DAVIS EDWARD E. DAWSON

VERENA H. DYSON CALVIN C. ELGOT FREDERIC B. FITCH G. HASENJAEGER HANS HERMES H. JEROME KEISLER KURT SCHÜTTE AZRIEL LÉVY DONALD MONK GERT H. MÜLLER

RÓZSA PÉTER MICHAEL O. RABIN GENE F. ROSE BARKLEY ROSSER ARTO SALOMAA DANA SCOTT JOSEPH R. SHOENFIELD J. F. THOMSON JEAN VAN HEIJENOORT

NUMBER 2 VOLUME 41 JUNE 1976

PUBLISHED QUARTERLY BY THE ASSOCIATION FOR SYMBOLIC LOGIC, INC. WITH SUPPORT FROM ICSU AND FROM INSTITUTIONAL AND CORPORATE MEMBERS

Copyright © 1976 by the Association for Symbolic Logic, Inc. Reproduction by photostat, photo-print, microfilm, or like process by permission only

TABLE OF CONTENTS

Countable initial segments of the degrees of unsolvability. By A. H. LACHLAN	280
Model radiation principles Dr. I.E. A. K. VAN PRINTIPA	201
Modal reduction principles. By J. F. A. K. VAN DENTHEM	501
On finite lattices of degrees of constructibility of reals. By ZOFIA ADAMOWICZ	313
A completeness theorem for Zermelo-Fraenkel set theory. By WILLIAM C. POWELL	323
Derived rules of inference related to the continuity of effective operations. By MICHAEL J. BEESON	328
An interpretation of "finite" modal first-order languages in classical second- order languages. By Scott K. LEHMANN	337
Krom formulas with one dyadic predicate letter. By HARRY R. LEWIS	341
Uniformly defined descending sequences of degrees. By HARVEY FRIEDMAN.	363
Noncharacterizability of the syntax set. By JOHN PAULOS	368
λ -scales, κ -Souslin sets and a new definition of analytic sets. By DOUGLAS R.	
Busch	373
Large and small existentially closed structures. By H. SIMMONS	379
Projective planes of infinite but isolic order. By J. C. E. DEKKER	391
Congruence relations, filters, ideals, and definability in lattices of α -recursively enumerable sets. By MANUEL LERMAN.	405
Types of simple α-recursively enumerable sets. By MANUEL LERMAN.	419
Equivalence of some definitions of recursion in a higher type object. By F.	127
LOWENTHAL	421
Modal formulas are either elementary or not $\Delta\Delta$ -elementary. By J. F. A. K. VAN BENTHEM	436
Normal functions and constructive ordinal notations. By LARRY W. MILLER	439
The decision problem for standard classes. By YURI GUREVICH	460

The JOURNAL OF SYMBOLIC LOGIC is the official organ of the Association for Symbolic Logic Inc., published quarterly, in the months of March, June, September, and December. The JOURNAL also contains the official notices of the Division of Logic, Methodology and Philosophy of Science of the International Union of History and Philosophy of Science.

Membership in the Association is open to any one interested in its work. Annual dues for students are \$8.00. Dues for other individual members are \$15.00 per year. Dues include subscription to the current volume of the JOURNAL. For their personal use, all members may purchase back issues at 25% discount.

For nonmembers, subscription to the current volume of the JOURNAL is \$40 per year. Back volumes may be purchased at \$20 per volume for volumes 1-17, \$25 per volume for volumes 18–36, \$45 for volume 37, \$53 for volume 38, and \$60 for volumes 39 and 40.

Applications for membership in the Association, requests for information, all business correspondence, and notices of change of address should be sent to *The Association for Symbolic Logic*, P.O. Box 6248, Providence, Rhode Island 02940. Dues and subscriptions to the JOURNAL should be sent to *The Association for Symbolic Logic*, P.O. Box 1571, Annex Station, Providence, Rhode Island 02901; all orders must be accompanied by payment.

Continued on inside back cover

Second-class postage rates paid at Providence, R.I. and additional offices.