

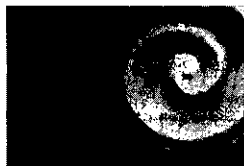
Herbert B. Enderton

A

MATHEMATICAL
INTRODUCTION
TO LOGIC

SECOND EDITION

Contents



PREFACE	<i>ix</i>
INTRODUCTION	<i>xi</i>
CHAPTER ZERO Useful Facts about Sets	<i>1</i>
CHAPTER ONE Sentential Logic	<i>11</i>
1.0 Informal Remarks on Formal Languages	<i>11</i>
1.1 The Language of Sentential Logic	<i>13</i>
1.2 Truth Assignments	<i>20</i>
1.3 A Parsing Algorithm	<i>29</i>
1.4 Induction and Recursion	<i>34</i>
1.5 Sentential Connectives	<i>45</i>
1.6 Switching Circuits	<i>54</i>
1.7 Compactness and Effectiveness	<i>59</i>
CHAPTER TWO First-Order Logic	<i>67</i>
2.0 Preliminary Remarks	<i>67</i>
2.1 First-Order Languages	<i>69</i>
2.2 Truth and Models	<i>80</i>
2.3 A Parsing Algorithm	<i>105</i>
2.4 A Deductive Calculus	<i>109</i>
2.5 Soundness and Completeness Theorems	<i>131</i>
2.6 Models of Theories	<i>147</i>
2.7 Interpretations Between Theories	<i>164</i>
2.8 Nonstandard Analysis	<i>173</i>
CHAPTER THREE Undecidability	<i>182</i>
3.0 Number Theory	<i>182</i>
3.1 Natural Numbers with Successor	<i>187</i>
3.2 Other Reducts of Number Theory	<i>193</i>
3.3 A Subtheory of Number Theory	<i>202</i>
3.4 Arithmetization of Syntax	<i>224</i>

3.5 Incompleteness and Undecidability	234
3.6 Recursive Functions	247
3.7 Second Incompleteness Theorem	266
3.8 Representing Exponentiation	276
CHAPTER FOUR Second-Order Logic	282
4.1 Second-Order Languages	282
4.2 Skolem Functions	287
4.3 Many-Sorted Logic	295
4.4 General Structures	299
SUGGESTIONS FOR FURTHER READING	307
LIST OF SYMBOLS	309
INDEX	311