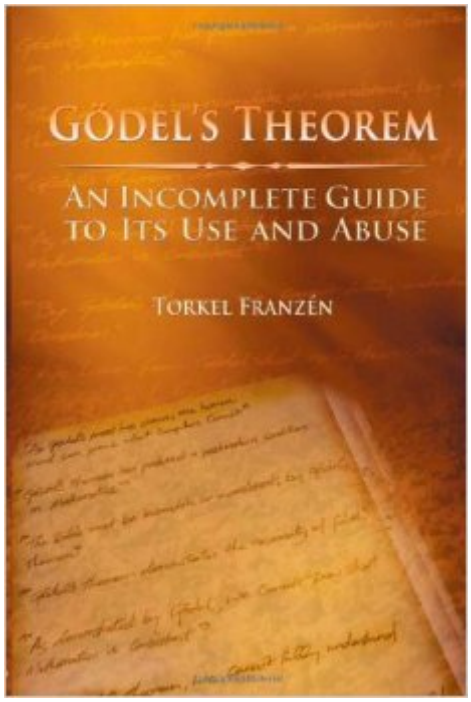
GÃ¶del's Theorem: An Incomplete Guide To Its Use And Abuse



Synopsis

"Among the many expositions of GÃ¶del's incompleteness theorems written for non-specialists, this book stands apart. With exceptional clarity, FranzÃ©n gives careful, non-technical explanations both of what those theorems say and, more importantly, what they do not. No other book aims, as his does, to address in detail the misunderstandings and abuses of the incompleteness theorems that are so rife in popular discussions of their significance. As an antidote to the many spurious appeals to incompleteness in theological, anti-mechanist and post-modernist debates, it is a valuable addition to the literature." --- John W. Dawson, author of Logical Dilemmas: The Life and Work of Kurt GÃ¶del

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Customer Reviews

As evidenced from the title, the primary focus of the book is to identify the specific nature of these theorems, where they apply directly, and where they do not apply directly, and where they are interpreted entirely erroneously.Although the book is aimed at non-mathematicians and those with no knowledge of formal logic, I can't really imagine someone with no understanding of logic and some fair amount of math comprehension benefitting alot from this book. I mean, by p. 10 he talking about Diophantine equations and Goldbach-like conjectures, and soon after, "PA" and "ZFC" are tossed about as if they were practically everyday acronyms for most people. The book is however, largely free of formulas and proofs, for those who are dissuaded by such. The overviews of the theorems themselves is not as lucid as I imagine they could be (which is why I rate it a 4 instead of

a 5). The overviews will also seem a bit alien to someone expecting and Nagel & Newman kind of treatment; instead, this is discussed from a more abstract perspective of the characteristics and properties of formal systems, which avoids getting into the gritty details (even GÃ¶del-numbering is not explained in detail!) but may be hard to grasp for someone not used to thinking at this level of abstraction about mathematical systems.With that said, I still think it is quite worthwhile reading, and at a slim 170ish pages, it is a fairly quick read. After the overviews, he takes on various applications/misapplications of the theorems by topic. So, there are discussion of the theorems' relevance or applicability to things such as TOE (Theory of Everything), Turing machines, skepticism, minds, inexhaustibility, computability and so on.

Torkel Franzen has created an immensely valuable, deeply fascinating examination of misunderstandings, misconceptions, and outright abuse of Godel's theorems frequently found on the Internet (and occasionally in print). He does so in a cogent, non-confrontational style that makes enjoyable reading. Godel's Theorem - An Incomplete Guide to Its Use and Abuse warrants five stars.A word of caution is appropriate, however. Chapters 2 and 3 will be heavy going for readers not familiar with formal logic. Although Franzen avoids the details of Godel numbers in his explication of Godel's proof, he does delve into topics like self-referential arithmetical statements, Tarski's theorem, Rosser sentences, weaker variants of the first incompleteness theorem, computably decidable sets, Turing's proof of the undecidable theorem, and the MRDP theorem.Furthermore, the appendix offers both a formal definition of the concept of a Goldbach-like arithmetical statement and comments on the significance of Rosser's strengthening of Godel's first incompleteness theorem. (Any reader that stays the course with the early chapters will be able to handle the appendix discussions. The short chapter 7 is also more technical as it discusses the completeness of first order logic.)A word of encouragement is equally appropriate. Chapters 2 and 3 can be browsed, even skipped outright. The later chapters are much more accessible and don't require that the earlier chapters have been mastered; instead, they focus on examples of the misuse of Godel's theorems - from the merely technically inaccurate to the humorously nonsensical. It is these later chapters that makes this book special.

This book seems cobbled together, and its exposition is unclear. Chapter one is a short seven-page introduction. Chapter two, entitled "The Incompleteness Theorem: An Overview", is forty-eight pages long, and this is where beginners are going to get frustrated and discouraged. Franzen does not sufficiently clarify for the uninitiated the difference between mathematical logic (first-order logic)

as an axiomatic system and a first-order theory (which he usually calls a formal system). So he also doesn't clarify (until he finally does, in chapter seven) the difference between the completeness of first-order logic and the incompleteness of the first-order theory of arithmetic (his mention of negation completeness isn't clear enough to be helpful). Nor is he helpful on the concepts of true or truth in relation to logical truth (tautology), to axiomatic systems, to consistency, to human knowledge, to number theory, or to mathematics. He does not speak directly upon the distinction between validity and provability. He isn't explicit about the distinction between well-formed formula (statement, sentence) and theorem. Confusion about these distinctions leads to confusion about the meaning and range of applicability of GÃ¶del's Theorems, so Franzen has not done a good enough job in this overview chapter of educating the uninitiated.In chapter three, Franzen attempts to introduce the notions of a computably enumerable set and a computably decidable set. He seems to believe that because he knows what he's talking about that what he's saying is clear.

(Violence and Abuse Series)