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	Titolo	The Real Numbers : An Introduction to Set Theory and Analysis / / by John Stillwell
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	Descrizione fisica	1 online resource (253 p.)
	Collana	Undergraduate Texts in Mathematics, , 2197-5604
	Disciplina	510
	Soggetti	Functions of real variables
		Mathematical logic
		Mathematics
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		Real Functions
		Mathematical Logic and Foundations
		History of Mathematical Sciences
	Lingua di pubblicazione	Inglese
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	Nota di contenuto	The Fundamental Questions -- From Discrete to Continuous -- Infinite Sets -- Functions and Limits -- Open Sets and Continuity -- Ordinals -- The Axiom of Choice -- Borel Sets -- Measure Theory -- Reflections -- Bibliography -- Index.
	Sommario/riassunto	While most texts on real analysis are content to assume the real numbers, or to treat them only briefly, this text makes a serious study of the real number system and the issues it brings to light. Analysis needs the real numbers to model the line, and to support the concepts of continuity and measure. But these seemingly simple requirements lead to deep issues of set theory—uncountability, the axiom of choice, and large cardinals. In fact, virtually all the concepts of infinite set theory are needed for a proper understanding of the real numbers, and hence of analysis itself. By focusing on the set-theoretic aspects of analysis, this text makes the best of two worlds: it combines a down-to-earth introduction to set theory with an exposition of the essence of analysis—the study of infinite processes on the real numbers. It is

intended for senior undergraduates, but it will also be attractive to graduate students and professional mathematicians who, until now, have been contentto "assume" the real numbers. Its prerequisites are calculus and basic mathematics. Mathematical history is woven into the text, explaining how the concepts of real number and infinity developed to meet the needs of analysis from ancient times to the late twentieth century. This rich presentation of history, along with a background of proofs, examples, exercises, and explanatory remarks, will help motivate the reader. The material covered includes classic topics from both set theory and real analysis courses, such as countable and uncountable sets, countable ordinals, the continuum problem, the Cantor–Schröder–Bernstein theorem, continuous functions, uniform convergence, Zorn's lemma, Borel sets, Baire functions, Lebesgue measure, and Riemann integrable functions.