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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Preliminaries -- The Main Results -- Proofs of the Main Results -- Specific Examples of Liouville-Riemann-Roch Theorems -- Auxiliary Statements and Proofs of Technical Lemmas -- Final Remarks and Conclusions.
Sommario/riassunto	This book is devoted to computing the index of elliptic PDEs on non-compact Riemannian manifolds in the presence of local singularities and zeros, as well as polynomial growth at infinity. The classical Riemann–Roch theorem and its generalizations to elliptic equations on bounded domains and compact manifolds, due to Maz'ya, Plameneskii, Nadirashvilli, Gromov and Shubin, account for the contribution to the index due to a divisor of zeros and singularities. On the other hand, the Liouville theorems of Avellaneda, Lin, Li, Moser, Struwe, Kuchment and Pinchover provide the index of periodic elliptic equations on abelian coverings of compact manifolds with polynomial growth at infinity, i.e. in the presence of a "divisor" at infinity. A natural question is whether one can combine the Riemann–Roch and Liouville type results. This monograph shows that this can indeed be done, however the answers are more intricate than one might initially expect. Namely, the interaction between the finite divisor and the point at infinity is non-trivial. The text is targeted towards researchers in PDEs, geometric analysis, and mathematical physics.