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Numerical semigroups and applications. 2nd extended and revised edition. (English)

Zbl 1444.20001

RSME Springer Series 3. Cham: Springer (ISBN 978-3-030-54942-8/hbk; 978-3-030-54943-5/ebook). xiv, 138 p. (2020).

Publisher's description: This book is an extended and revised version of [the first author and the third author, Numerical semigroups and applications. Cham: Springer (2016; Zbl 1368.20001)] as part of the RSME series. Like the first edition, it presents applications of numerical semigroups in Algebraic Geometry, Number Theory and Coding Theory. It starts by discussing the basic notions related to numerical semigroups and those needed to understand semigroups associated with irreducible meromorphic series. It then derives a series of applications in curves and factorization invariants. A new chapter is included, which offers a detailed review of ideals for numerical semigroups. Based on this new chapter, descriptions of the module of Kähler differentials for an algebroid curve and for a polynomial curve are provided. Moreover, the concept of tame degree has been included, and is viewed in relation to other factorization invariants appearing in the first edition. This content highlights new applications of numerical semigroups and their ideals, following in the spirit of the first edition.

MSC:

- 20-01 Introductory exposition (textbooks, tutorial papers, etc.) pertaining to group theory
- 20M14 Commutative semigroups
- 20M05 Free semigroups, generators and relations, word problems
- 13F25 Formal power series rings
- 14H50 Plane and space curves
- 14G50 Applications to coding theory and cryptography of arithmetic geometry
- 20-04 Software, source code, etc. for problems pertaining to group theory
- 14-04 Software, source code, etc. for problems pertaining to algebraic geometry

Keywords:

numerical semigroups; irreducible numerical semigroups; free numerical semigroups; semigroups associated with irreducible meromorphic series; Newton-Puiseux exponents; characteristic sequences; intersection multiplicity; minimal presentations; factorizations; non-unique factorization; Feng-Rao distance

Software:

Normaliz

Full Text: [DOI](#)