

1. Record Nr.	UNINA9910508482303321
Autore	Anderson David F. <1948->
Titolo	Graphs from rings // David F. Anderson [and three others]
Pubbl/distr/stampa	Cham, Switzerland : , : Springer, , [2021] ©2021
ISBN	3-030-88410-4
Descrizione fisica	1 online resource (548 pages) : illustrations
Disciplina	511.5
Soggetti	Graph theory Commutative rings Algebra Anells commutatius Teoria de grafs Llibres electrònics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Intro -- Preface -- Notation -- Contents -- Chapter 1 Introduction -- 1.1 Basics in Algebra -- 1.2 Basics in Graph Theory -- Chapter 2 Distances in Zero-divisor Graphs -- 2.1 Zero-divisor Graphs -- 2.2 Basic Properties of Zero-divisor Graphs -- 2.3 Girth of Zero-divisor Graphs -- 2.3.1 Rings of Polynomials and Power Series -- 2.3.2 Idealization -- 2.3.3 Rings with Linearly Ordered Primes -- 2.4 Diameter of Zero-divisor Graphs -- 2.4.1 Rings of Polynomials and Power Series -- 2.4.2 Idealization -- 2.4.3 Rings with Linearly Ordered Primes -- 2.5 Radius and Center of Zero-divisor Graphs -- 2.6 Rings without Identity -- Chapter 3 Properties of Zero-divisor Graphs -- 3.1 Coloring of Zero-divisor Graphs -- 3.1.1 Vertex Coloring -- 3.1.2 Clique Number -- 3.1.3 Edge Coloring -- 3.2 Connectivity of Zero-divisor Graphs -- 3.3 Isomorphisms and Automorphisms -- 3.4 Bipartite Zero-divisor Graphs -- 3.5 Zero-divisor Graphs of Gaussian Integers -- 3.6 Cycles in Zero-divisor Graphs -- 3.6.1 Trees and Complements -- 3.6.2 Eulerian and Hamiltonian Graphs -- Chapter 4 Genus of Zero-divisor Graphs -- 4.1 Genus of Graphs -- 4.2 Planar Zero-divisor Graphs -- 4.3 Zero-divisor Graphs with Genus One -- 4.4

Zero-divisor Graphs with Genus Two -- 4.5 Zero-divisor Graphs with Large Genus -- 4.6 Crosscap of Zero-divisor Graphs -- 4.7 Embedding of Line Graphs -- Chapter 5 Generalized Zero-divisor Graphs -- 5.1 Ideal-based Zero-divisor Graphs -- 5.2 Properties of $I(R)$ -- 5.2.1 Clique Number of Ideal-based Zero-divisor Graphs -- 5.3 Genus of Ideal-based Zero-divisor Graphs -- 5.4 Primal Ideal-based Zero-divisor Graphs -- 5.5 Annihilating-ideal Graphs -- 5.6 Special Annihilating-ideal Graphs -- 5.7 Coloring of Annihilating-ideal Graphs -- 5.8 Genus of Annihilating-ideal Graphs -- 5.9 Compressed Zero-divisor Graphs -- 5.9.1 Properties of Compressed Zero-divisor Graphs. 5.9.2 Girth of Compressed Zero-divisor Graphs -- 5.10 Extended Zero-divisor Graphs -- Chapter 6 Zero-divisor Graph Generalizations -- 6.1 Noncommutative Rings -- 6.1.1 Directed Zero-divisor Graphs of Finite Rings -- 6.2 Commutative Semigroups -- 6.3 Commutative Semirings -- 6.4 Modules -- 6.4.1 Torsion Graphs of Modules -- 6.4.2 Zero-divisor Graphs of Modules -- 6.4.3 Annihilator Ideal-based Graphs of Modules -- 6.5 Domination in Directed Zero-divisor Graphs -- Chapter 7 Total Graphs of Commutative Rings -- 7.1 Definition of Total Graph -- 7.2 Basic Properties of Total Graphs -- 7.3 Polynomial Rings and Idealization -- 7.4 Properties of Total Graphs -- 7.4.1 Eulerian and Hamiltonian Graphs -- 7.4.2 Colorings -- 7.4.3 Connectivity -- 7.4.4 Domination -- 7.4.5 Intersection Graphs of Dominating Sets -- 7.5 Genus of Total Graphs -- Chapter 8 Graphs from Total Graphs -- 8.1 Total Graphs without the Zero Element -- 8.1.1 Basic Properties -- 8.1.2 Zero-divisor Paths and Regular Paths -- 8.2 The Regular Graph -- 8.3 Complements of Total Graphs -- 8.4 Generalized Complements of Total Graphs -- 8.5 Line Graphs of Total Graphs -- Chapter 9 Generalized Total Graphs -- 9.1 Commutative Ring Generalizations -- 9.1.1 Ideal-based Generalized Total Graphs -- 9.1.2 Total Graphs of Multiplicatively Closed Sets -- 9.1.3 Total Graphs of Multiplicative-prime Sets -- 9.2 Total Graphs of Modules -- 9.2.1 Total Torsion Element Graphs -- 9.2.2 Total Graphs of Modules -- 9.3 Commutative Semirings -- 9.3.1 Total Graphs of Semirings -- 9.3.2 Identity Summand Graphs -- Chapter 10 Other Graphs Associated with Rings -- 10.1 Graphs of Commutative Rings -- 10.1.1 Cayley Graphs -- 10.1.2 Co-maximal and Unit Graphs -- 10.1.3 Cozero-divisor Graphs -- 10.1.4 Jacobson and Intersection Graphs -- 10.2 Annihilator Graphs -- 10.2.1 Equal Annihilator and Zero-divisor Graphs. 10.3 Compressed Annihilator Graphs -- 10.4 $I(R)$, $I(R)$, and $AGI(R)$ -- 10.5 Congruence-based Graphs -- 10.6 Element Graphs -- 10.7 Dot Product Graphs -- 10.7.1 Subgraphs of Dot Product Graphs -- 10.7.2 Equivalence Dot Product Graphs -- 10.8 Trace Graph of Matrices -- 10.8.1 Basic Properties of Trace Graphs -- 10.8.2 Planarity and Thickness of Trace Graphs -- 10.8.3 Domination in Trace Graphs of Matrices -- 10.8.4 Ideal-based Trace Graphs of Matrices -- 10.9 Graphs of Noncommutative Rings -- 10.9.1 Commuting and Non-commuting Graphs -- 10.9.2 Nilpotent and Idempotent Graphs -- 10.10 Graphs of Ideals -- 10.11 Divisor Graphs -- 10.12 Subgroup Graphs of a Group -- Bibliography -- Index.
