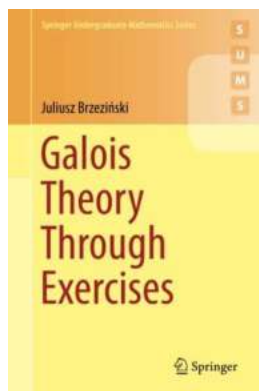# Galois Theory Through Exercises Springer Undergraduate Mathematics - Unlock the Secrets of Abstract Algebra!

Welcome to the exciting world of abstract algebra! In this article, we will delve into the fascinating subject of Galois Theory, using the book "Galois Theory Through Exercises" by Springer Undergraduate Mathematics. Whether you're a student studying math or simply curious about this field, get ready to unlock the secrets of abstract algebra through engaging exercises and mind-bending concepts.

## What is Galois Theory?

Galois Theory is a branch of abstract algebra that investigates the connection between field extensions and group theory. It was named after Evariste Galois, a French mathematician who made significant contributions to the study of symmetry and polynomials in the 19th century.

### Galois Theory Through Exercises (Springer Undergraduate Mathematics Series)

by Juliusz Brzeziński (1st ed. 2018 Edition, Kindle Edition)

★★★★☆    4.9 out of 5

Language        : English
File size       : 6353 KB
Screen Reader : Supported
Print length    : 310 pages

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The theory provides a framework for understanding and solving polynomial equations. It explores the concept of fields, which are mathematical structures that generalize the properties of numbers. By studying the symmetries and permutations of roots of polynomial equations, Galois Theory uncovers deep connections between algebraic fields and group theory.

## Why Galois Theory Matters

Galois Theory has far-reaching implications in various fields of mathematics, including number theory, algebraic geometry, and cryptography. It not only helps us solve polynomial equations but also provides insights into the nature of mathematical structures.

Understanding Galois Theory allows mathematicians to tackle complex problems by breaking them down into simpler, more manageable components. It lays the foundation for advanced mathematical concepts and plays a crucial role in many areas of research and application.

## The Book "Galois Theory Through Exercises"

"Galois Theory Through Exercises" published by Springer Undergraduate Mathematics is a valuable resource for anyone interested in learning Galois Theory. This book offers a hands-on approach to the subject, providing numerous exercises and examples to reinforce understanding.

With clear explanations and step-by-step solutions, the book guides readers through the fundamental concepts of Galois Theory. It covers topics such as field extensions, Galois groups, normal and separable extensions, solvable groups, and more.

## Unlocking the Secrets of Abstract Algebra

Abstract algebra may seem intimidating at first, but with the right resources and approach, it becomes accessible and even enjoyable. "Galois Theory Through Exercises" offers a gradual learning curve, ensuring that readers grasp the concepts and build a solid foundation.

By working through the exercises in the book, readers can actively apply the theory to real-world problems. This interactive learning style fosters a deeper understanding and helps develop problem-solving skills. Galois Theory reveals the intricate connections between seemingly unrelated areas of mathematics, opening up a new world of possibilities.

Galois Theory is a captivating field within abstract algebra that uncovers the hidden symmetries and connections between algebraic structures. "Galois Theory Through Exercises" by Springer Undergraduate Mathematics acts as a guide, assisting readers in mastering the fundamentals and discovering the beauty of this subject.

So, if you're ready to embark on a journey into abstract algebra and unlock the secrets of Galois Theory, grab a copy of "Galois Theory Through Exercises" and prepare to be amazed!
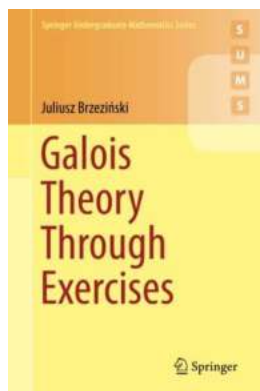
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This textbook offers a unique to classical Galois theory through many concrete examples and exercises of varying difficulty (including computer-assisted exercises).

In addition to covering standard material, the book explores topics related to classical problems such as Galois' theorem on solvable groups of polynomial equations of prime degrees, Nagell's proof of non-solvability by radicals of quintic equations, Tschirnhausen's transformations, lunes of Hippocrates, and Galois' resolvents. Topics related to open conjectures are also discussed, including exercises related to the inverse Galois problem and cyclotomic fields. The author presents proofs of theorems, historical comments and useful references alongside the exercises, providing readers with a well-rounded to the subject and a gateway to further reading.

A valuable reference and a rich source of exercises with sample solutions, this book will be useful to both students and lecturers. Its original concept makes it particularly suitable for self-study.
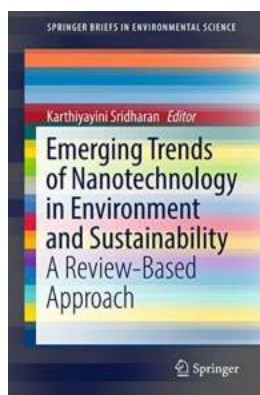
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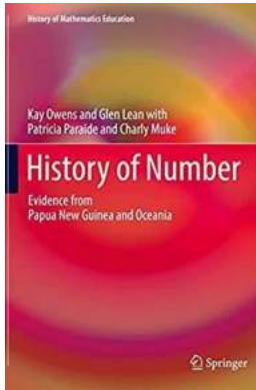
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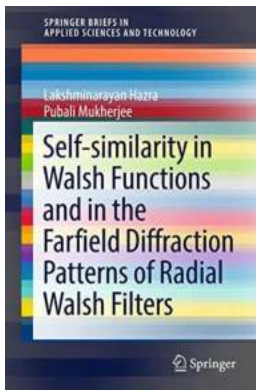
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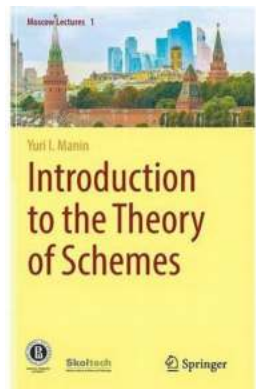
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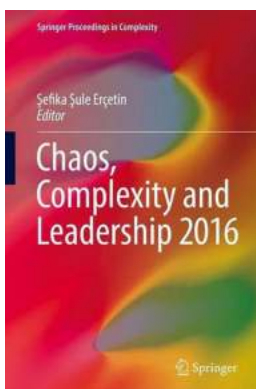
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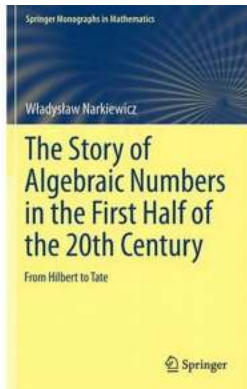
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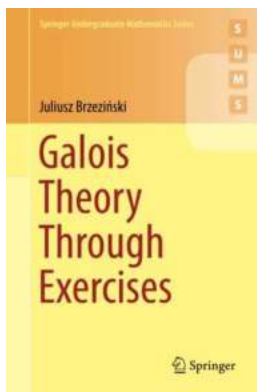
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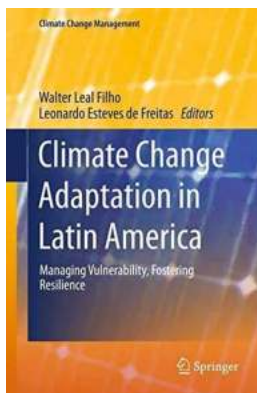
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