

Algebra II: Exercises

These notes reflect material from our text, *A First Course in Abstract Algebra, Seventh Edition*, by John B. Fraleigh, published by Addison-Wesley, 2003.

Chapter 7. Advanced Group Theory

- §34. *Isomorphism Theorems*: 2, 4, 6, 7, 9
- §35. *Series of Groups*: 2, 6, 8, 12, 14, 19, 20, 22, 23, 25
- §36. *Sylow Theorems*: 2, 4, 5, 6, 11, 13, 14, 17, 18
- §37. *Applications of the Sylow Theory*: 1, 4, 6, 9, 10, 11
- §38. *Free Abelian Groups*: 2, 4, 7, 10, 11, 12, 13, 20
- §39. *Free Groups*: 1, 2, 4, 5, 11, 12, 13
- §40. *Group Presentations*: 2, 4, 10, 11

Chapter 8. Groups in Topology

- §41. *Simplicial Complexes and Homology Groups*: 2, 4, 5, 8, 10, 12, 13
- §42. *Computations of Homology Groups*: 2, 4, 6, 8, 10
- §43. *More Homology Computations and Applications*: 2, 4, 5, 7, 8, 10
- §44. *Homological Algebra*: 2, 4, 6, 8, 10, 11

Chapter 9. Factorization

- §45. *Unique Factorization Domains*: 2, 4, 6, 8, 10, 12, 14, 16, 25, 26, 29, 30, 31, 34
- §46. *Euclidian Domains*: 2, 4, 6, 8, 10, 15, 16, 17, 18, 20, 24
- §47. *Gaussian Integers and Multiplicative Norms*: 2, 4, 6, 10, 12, 14, 15, 16

Chapter 10. Automorphisms and Galois Theory

- §48. *Automorphisms of Fields*: 2, 4, 6, 8, 10, 12, 14, 15, 16, 18, 20, 22, 24–28, 32–39
- §49. *The Isomorphism Extension Theorem*: 2, 4, 6, 7, 9–13
- §50. *Splitting Fields*: 2, 4, 6, 8, 10, 13, 17–25
- §51. *Separable Extensions*: 2, 4, 7, 9–20
- §52. *Totally Inseparable Extensions*: 2, 4, 6–8
- §53. *Galois Theory*: 2, 4, 6, 8, 10, 12, 16–24
- §54. *Illustrations of Galois Theory*: 2, 4, 6, 8, 10, 11
- §55. *Cyclotomic Extensions*: 2, 4, 6, 8, 10–12
- §56. *Insolvability of the Quintic*: 1, 2, 4, 5, 8