

Math 112-40, Mr. Church
Studying for the final
Topics covered (page 1) and study questions (page 2)

TOPICS COVERED

These are the sections of the book that we have covered in this course.

- Section 1.1: Numbers, Sets, and Functions
- Section 1.2: Rules of Arithmetic (Axioms for a Ring)
- Section 1.3: Even-Odd Arithmetic [\mathbb{Z}_2]
- Section 1.4: One's Digit Arithmetic [\mathbb{Z}_{10}]
- Section 2.1: Consequences of the Rules of Arithmetic [theorems about rings]
- Section 2.2: Inequalities and Order
- Induction
- Section 3.1: Divisibility
- Section 3.2: Greatest Common Divisor
- Section 3.3: Primes
- Section 4.1: The Division Algorithm
- Section 4.2: The Euclidean Algorithm and GCDs
- Section 4.3: The Fundamental Theorem of Arithmetic [prime factorization]
- Least Common Multiples (part of Section 5.2)
- Section 6.1: Congruences
- Section 6.2: Groups
- Groups of units; units modulo m
- Section 7.1: Divisibility Tests
- Section 7.3: Check Digits (ISBNs)
- Section 8.2: Infinity [sizes of sets, countability]

STUDY QUESTIONS

I have selected certain questions from the textbook which would be good to study. This is just a rough guide to which questions are especially worth reviewing. The final is cumulative, so the list includes questions from all the chapters we have covered.

Good. These questions would be good ones to study; these are questions that did not previously appear on this list.

- Chapter 1: 6, 21, 22, 24
- Chapter 2: 9, 15
- Chapter 4: 8, 13, 20
- Chapter 6: 6, 13, 14, 16, 17, 18, 19, 21, 29, 30, 31, 37
- Chapter 7: 1, 10, 11

Still good. These questions appeared on this list before, but are still good to review.

- Chapter 1: 9, 10, 11, 13, 16, 17, 19, 20
- Chapter 2: 1, 2, 4, 10, 11
- Chapter 3: 2, 7, 8, 10, 11, 12
- Chapter 4: 1, 3, 4, 6, 12, 23
- Chapter 5: 1, 20, 21
- Chapter 6: 5, 7

OK. It wouldn't hurt to look at these questions, but it's not imperative. (In some cases this is because the question is now standard for us.)

- Chapter 1: 3, 4, 5, 7, 12, 14, 15, 28, 30
- Chapter 2: 7, 12, 13, 14
- Chapter 3: 9, 16
- Chapter 4: 14, 15, 17, 18
- Chapter 6: 1, 2, 3, 4, 12

Practice problems. Most practice problems are useful, because you can compare your answer with the solution in the book. These are the ones I think are most useful. (New questions are bolded.)

- Chapter 1: 4, 7, 8, 10, 18, 22
- Chapter 2: 2, **3**, 4, 5, 6, 7
- Chapter 3: 1, **3**, 4, 5
- Chapter 4: 1, 3, 4
- Chapter 5: 8
- Chapter 6: **6**, **8**, **9**, **11**, **12**
- Chapter 7: **2**
- Chapter 8: **4**, **5**

Note regarding axioms and theorems. On the final, I will provide a sheet listing all the axioms for a ring, the order axioms, and the axioms for a group (together with the definition of each axiom), and also the Theorems from Chapter 2.