

## Items to Know for Test 1

### Sections covered

Test 1 will cover the topics from chapters 1 and 2. You will need to know the following information.<sup>1</sup>

### Definitions

Be sure to know all of the main definitions, specifically including:

- Divides
- Greatest Common Divisor
- Prime
- Congruent
- $\mathbb{Z}_n$
- Congruence Class
- Multiplication and Addition in  $\mathbb{Z}_n$

### Theorems/Corollaries/Lemmas

Be sure to know all of the main Theorems and Corollaries, specifically including:

- The Well-Ordering Axiom
- The Division Algorithm
- The Divisor Theorem
- Theorem 1.3
- The Euclidean Algorithm
- Theorem 1.8
- The Fundamental Theorem of Arithmetic
- Properties of Congruence: Theorem 2.1, 2.2, 2.3, 2.6, 2.7
- Theorem 2.8
- Theorem 2.11

### Know the proofs of:

Theorems:

- The Divisor Theorem
- Theorem 1.5
- Theorem 2.1
- Theorem 2.2
- Theorem 2.7

Homework questions

### Know how to use/compute:

- The Division Algorithm
- The Euclidean Algorithm
- Finding the prime factorization of a number
- Addition/Multiplication tables in  $\mathbb{Z}_n$
- Solving for  $x$  in  $ax = b$  in  $\mathbb{Z}_n$

### Format of the test

There will be several definitions to state or to answer questions about, several questions to prove, and several computational questions (ie: find the gcd of two numbers using the Euclidean Algorithm).

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<sup>1</sup> While this should be a complete list of anything that might be on the test, I reserve the right to include anything that we have talked about in class.