

MATH 340 Assignment 3, Fall 2007

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This assignment is to be handed in on Friday October 5th by 10:30am.

Late penalty: -20% for handing in by 9:30am Tuesday October 9th. Zero after that.

Section 1.7: Equations in \mathbb{Z}_n

Prove Corollary 1.7.6 parts (i) and (ii) on page 39. Do (ii) first.

Solve $81x = 105$ for $x \in \mathbb{Z}_n$ with $n = 879$ using the method presented in class.

Section 1.8: Bar Codes

Exercises 1, 2, 3.

Section 1.10: Euler's ϕ -function

Exercise 3, 4.

Section 1.11: Theorem's of Euler and Fermat

Exercises 2, 3, 8.

Prove Theorem 1.11.1 (Euler's theorem) using the same approach given in class to prove Theorem 1.11.3 (Fermat's little Theorem). First prove that if $a \in \mathbb{Z}_n^*$ then $a\mathbb{Z}_n^* = \mathbb{Z}_n^*$.

Section 2.1: Basic Properties

Exercises 1, 4, 7, 10, 14, 16.

For exercise 10, use the fact that $\mathbb{Q}[\sqrt{2}]$ is a subset of the real numbers \mathbb{R} which is a field, so that you don't have to prove all the field axioms.