

MATH 512 HOMEWORK 9, SPRING 2020

DUE BEFORE CLASS ON WEDNESDAY, APRIL 29.

One goal for this course is for you to develop your skill in effectively communicating mathematics. With this in mind, you should clearly write up your solutions. **Solutions with little or no justification will receive little or no credit.**

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- (1) Read Chapter 12.
- (2) Do exercises 12.3 parts 1 and 2. For part 2, you just consider the coefficients in \mathbb{Z}_3 . (Since this is a field with 3 elements, we also use the notation \mathbb{F}_3 .) Do exercise 12.5 parts 1 and 2.
- (3) Do exercises 12.6 and 12.7.
- (4) Please carefully read the results for the result on unique factorization in the polynomial ring $K[x]$, for a field K . You do not need to turn in the proofs here, (Exercises 12.9 and 12.10), but you should at least sketch them out for yourself.
- (5) Write a short paragraph to explain the final result (part 5) of Exercise 13.7. You may want to re-work the computation, but you only need to submit the short paragraph.
- (6) Do either one of exercise 13.9 or exercise 13.11. If you do the latter, it is fine to assume the result of Wilson's theorem.

Have a safe, healthy and peaceful week!!!