Items to Know for
Test 3

Sections covered
Test 3 will cover the topics from chapters 5 and 6 as well as section 4.4.[1]

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

- Polynomial function
- Irreducible polynomials / Roots of polynomials
- Congruence in F[x] and in R
- Extension Field / Quotient Ring
- Ideal / Coset
- Kernel / Image

Theorems/Corollaries/Lemmas to know:

- The Remainder Theorem (Theorem 4.14)
- The Factor Theorem (Theorem 4.15)
- *Properties of roots (4.16 – 4.19)*
- *Properties of congruence (5.1 – 5.4)*
- Corollary 5.5
- *Properties of a Quotient Ring (5.6, 5.7)*
- Theorem 5.8
- Theorem 5.9
- Theorem 5.10
- Theorem 5.11
- The Ideal Theorem (Theorem 6.1)
- *Properties of Ideals (6.4 – 6.8)*
- Theorem 6.9
- Theorem 6.11

Know the proofs of (ie: be able to replicate these proofs):

- Theorem 4.14
- Theorem 5.2
- Theorem 6.2
- Theorem 6.10
- Theorem 6.11
- Homework questions

Know how to use/compute:

- Determine whether a polynomial is irreducible or a unit
- Determine whether two polynomials are congruent
- Compute the addition/multiplication tables for a Quotient Ring
- Determine what type of ring the Quotient ring is (ie: field? Integral domain?)
- Determine whether a set is an ideal
- Find all of the principal ideals of a ring

Format of the test
It will be the same as that of the previous tests, including a list of important theorems at the end.

[1] While this should be a complete list of anything that might be on the test and more, I reserve the right to include anything that we have talked about in class. Be aware you may also need to use information from previous chapters.