

Math 403, Jeffrey Adams

Review of Rings

1. Section 12: definition and properties of rings, subrings, unity, subrings
2. Section 13
 - (a) zero-divisors
 - (b) integral domains
 - (c) fields
 - (d) $\mathbb{Z}_p$
 - (e) characteristic of integral domains
3. Section 14
 - (a) Ideals
 - (b) Factor rings
 - (c) Prime and maximal ideals
4. Section 15
 - (a) Ring homomorphisms
 - (b) Kernel, is an ideal
 - (c) First isomorphism theorem
 - (d) Field of quotients of an integral domain
5. Section 16
 - (a) Polynomial rings
 - (b) Division algorithm
 - (c) $\mathbb{F}[x]$ is a principal ideal domain
6. Section 17
 - (a) irreducible polynomials over integral domains
 - (b) irreducible polynomials over fields
 - (c) reducible over $\mathbb{Q}$ implies reducible over $\mathbb{Z}$
 - (d) Eisenstein's criterion
 - (e) irreducible of the cyclotomic polynomials over $\mathbb{Q}$
 - (f) In $\mathbb{F}[x]$ maximal if and only if irreducible