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