Mathematics 361: Number Theory
Assignment #6

Reading: Ireland and Rosen, Chapter 5 (including the exercises)

Problems:
Ireland and Rosen, Exercises 4.8, 4.13 as it should be phrased (do these first); 4.1, 4.17, 4.18; 4.2 (for $p = 7, 11, 13$), 4.19; 4.9, 4.10 (let $f(d) = \sum_{u: \text{order } d} u$ and let $g(d) = \sum_{u: u^d = 1} u$, which can be evaluated as a geometric sum; $g$ has an expression in terms of $f$ and then Möbius inversion gives $f$ in terms of $g$; the exercise is requesting $f(p - 1)$; 4.20 excluding the $p = 19$ part. (The more you use algebra, the less tedious these will be.)