Tutorial 3 – Algebra 2019

Feel free to use whatever resources you have at your disposal.

(1) Familiarize yourself with the Euclidean algorithm and Bezout's lemma. How can it be used to calculate the inverse of an element in $\mathbb{Z}/p\mathbb{Z}$? Work through the full algorithm in some examples of increasing complexity, until you are confident in using it.

(2) If you paid close attention in class, you watched me construct $\mathbb{F}_8$ as the quotient of a polynomial ring. Work through this construction and understand it in detail. Which property of the polynomial used makes this work? Which other polynomial could you have used? Work through both constructions in detail and then seen whether you can find an isomorphism between the two fields you constructed.

(3) If this was easy, construct $\mathbb{F}_{16}$.