Fall 2019, Math 620: Preliminary Problem Set 10
Due: Thursday, November 7th, 2019
Field Extensions

Preliminary problems. These problems should be completed before discussion on Thursday.

(P1) Completely factor the following polynomials over the specified fields.

(a) $x^3 - 1$ over $\mathbb{Q}$ (should have 2 irreducible factors).

(b) $x^5 + x^4 - x - 1$ over $\mathbb{Q}$ (should have 4 irreducible factors).

(c) $x^4 + 3x + 1$ over $\mathbb{Z}_5$ (should have 2 irreducible factors).