Math 494, Homework 2: due Feb 4

(1) Determine all irreducible degree-1 polynomials in $(\mathbb{Z}/n\mathbb{Z})[x]$ for as many positive integers n as you can.

(2) Problems 3.3–3.8 and 3.10 from chapter 11 of Artin.

Extra credit: Let K be a field, and let $f(x)$, $g(x)$, $h(x)$ be nonzero polynomials in $K[x]$ such that $f+g=h$ and $\gcd(f,g)=1$ and $f'(x)\neq 0$ (cf. problem 3.5). Show that

$$\max(\{\deg(f), \deg(g), \deg(h)\}) \leq \deg(N) - 1$$

where $N(x)$ is the product of the distinct monic irreducible polynomials in $K[x]$ which divide fgh.