Last name _____

First name _____

LARSON—MATH 610—CLASSROOM WORKSHEET 29
Polynomials, Ideals, Determinants.

Concepts & Notation

- (Sec. 4.1) *linear algebra, $\mathbb{F}^\infty$, algebra of formal power series.*

- (Sec. 4.2) $\mathbb{F}[x]$, *degree, scalar* polynomial, *monic* polynomial.

- (Sec. 4.4) *polynomial ideal.*

- (Sec. 5.1) *n-linear* function, *alternating function, determinant function*, det A.

1. What is an *ideal* in $\mathbb{F}[x]$? What is a *principle ideal*?

2. (**Claim:**) Every ideal in $\mathbb{F}[x]$ is *principle*.

3. What is an *n-linear* function?

4. What is an *alternating* function?

5. What is a *determinant* function?

Let A be an $n \times n$ matrix over a *commutative ring.* Let:

$$\det A = \sum_{\sigma \in S_n} (sgn\ \sigma) \prod_{i=1}^{n} A_{i,\sigma(i)}.$$

6. What is "σ", what is S_n and how does this definition work?