Last name _____

First name _____

LARSON—MATH 610—CLASSROOM WORKSHEET 29
Determinants.

Concepts & Notation

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

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

2. What are examples of n-linear functions?

3. What is an *alternating* function?

4. What are examples of alternating functions?

5. What is a *determinant* function?

6. What is an example of a determinant function?

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

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

7. What is σ and what is S_n?

8. Let $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ Use this definition to find $\det A$.

9. Let $A = \begin{bmatrix} A_{11} & A_{12} \\ A_{21} & A_{22} \end{bmatrix}$. Check that $\det A = A_{11}A_{22} - A_{12}A_{21}$.