# Warm up problems; do not turn them in; Read all the statements. 

1. Apostol II, $2.20: 5,11$.
2. Apostol II, 2.21: 1, 2.
3. Apostol II, $3.6: 5,11$.
4. Apostol II, $3.11: 6,7$.
5. Apostol II, 3.17 : 1.

Due in class February 5, 2009.

Read on book: Section 3.4, 3.16.

1. Apostol II, 2.20 : 9.
2. Apostol II, 2.21: 7, 8 .
3. Apostol II, $3.6: 1,2,3$.
4. Apostol II, 3.17: 2, 3 .
5. An elementary matrix $E$ is the matrix corresponding to the following transformations:
(1) Add a multiple of one row to another,
(2) Interchange rows,
(3) Multiply a row by a non-zero constant.

Compute $d(E)$ in each of the above cases.
6. Show that $d\left(E_{i} \cdot E_{j}\right)=d\left(E_{i}\right) d\left(E_{j}\right)$, for any two elementary matrices
7. If $A$ is any matrix and $U$ its Gauss-Jordan form, show that $d(A)=d\left(E_{1}\right) \cdots d\left(E_{k}\right) d(U)$.
8. Using (6)-(8) conclude that $\operatorname{det}(A B)=\operatorname{det}(A) \operatorname{det}(B)$.

