Math 369 HW #4
Due 8:00 AM Friday, Feb. 24

1. Compute the determinants of the following matrices:

   (a) $A = \begin{bmatrix} 1 & -3 & 0 \\ -2 & 4 & 1 \\ 5 & -2 & 2 \end{bmatrix}$

   (b) $B = \begin{bmatrix} 1 & -2 & 3 & 1 \\ 5 & -9 & 6 & 3 \\ -1 & 2 & -6 & -2 \\ 2 & 8 & 6 & 1 \end{bmatrix}$

2. What is the determinant of the following matrix? Simplify as much as possible.

$$\begin{bmatrix} \sin\theta & \cos\theta & 0 \\ -\cos\theta & \sin\theta & 0 \\ \sin\theta - \cos\theta & \sin\theta + \cos\theta & 1 \end{bmatrix}$$

3. Suppose A and B are square matrices. Is it true that $\det(A + B) = \det(A) + \det(B)$? If yes, then explain why this is true. If no, then give an example of matrices A and B for which this fails.

4. Suppose A is a 4×4 matrix and that the matrix B is obtained from A by interchanging the first two rows of A, and then interchanging the last two rows. Is it true that $\det(A) = \det(B)$? If yes, then explain why this is true. If no, then give an example of a matrix A for which this fails.