

5B1456, Matrix Algebra
Assignment 5
due Oct. 10, 2004

- (1) Let A be a real 2×2 matrix with null trace.
 - (a) Find e^A .
 - (b) Consider the set $S = \{A \in M_2(\mathbb{R}) \text{ such that } \text{tr}(A) = 0\}$. Show that the exponential map restricted to S is not surjective.
- (2) Let A be a skew symmetric real 3×3 matrix. Find e^A .
- (3) Show that for any complex $n \times n$ matrix A

$$\det(e^A) = e^{\text{tr}(A)}$$