# Math 534A Homework 8.

Due 11/18

1. Let $\mathrm{SL}(n, \mathbb{R})$ be the set of $n \times n$ matrices with determinant equal to 1. Prove that $\mathrm{SL}(2, \mathbb{R})$ is a manifold of dimension $n^2 - 1$. Hint: you may use the fact that if you have a matrix smooth function $M(t)$ and $\det M(t) > 0$ then $\frac{d}{dt} \log \det M(t) = \mathrm{tr}\left(M^{-1} \frac{dM}{dt}\right)$ (why is this true?).
2. *Lee 11-1
3. Lee 11-4.
4. Lee 11-7.

Note: * means that I want someone to look at your answer and attest to it before submitting.