Diff Geometry (Due 10/9/09)   FALL 09

I] a/ Prove that $O(n)$ is a manifold.

b/ Identify $T_I O(n)$ with a set S of $n \times n$ matrices

c/ Prove that $T O(n)$ is parallelisable

II] f a diffeomorphism between two manifolds M and N. $m \in M$ and $p = f(m)$. Consider $Y \in T_p(N)$ and $\gamma \in \wedge^q N$. Express $f^* i(Y) \gamma$ in terms of $f^* \gamma$

III] Prove that for any C^∞ differentiable manifold M the tangent space TM is orientable