Math 534A Homework 5.

Due 10/7

1.* Suppose $F : M \to N$ is a smooth map. Recall the definitions $T_p^{\text{path}} M$ and $T_p^{\text{der}} M$, and denote the associated push forwards as F_*^{path} and F_*^{der}. Show that the following diagram is commutative:

$$\begin{array}{ccc} T_p^{\text{path}} M & \overset{F_*^{\text{path}}}{\to} & T_{F(p)}^{\text{path}} N \\ \downarrow & & \downarrow \\ T_p^{\text{der}} M & \overset{F_*^{\text{der}}}{\to} & T_{F(p)}^{\text{der}} N \end{array}$$

2. Prove proposition 3.8 (there is a proof, so just give a proof in your own words)

3. Lee 3-1.

4. Lee 3-2

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