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Info. Sheet 4; Advanced Topics in Geometry E1 (MTH.B505)

Addendum

- In Lemma 3.5, the assumption that $\langle\ ,\ \rangle$ to be non-degenerate is essential. Otherwise, $m + r \leqq n$ holds, in general.
- The fourth subproblem in Problem 3-1, the assumption $\det A = 1$ is not necessary. In fact, the property $a_{00} \geqq 1$ is sufficient to show the the upper-half component of the two-sheated hyperboloid is mapped to itself. The condition of positive determinant is that guarantee the map preserves the **orientation** of the surface.

Corrections

- Lecture Note page 7, line 2 of Example 2.23: $T_{\boldsymbol{x}}\mathbb{E}^{n+1} \Rightarrow T_{\boldsymbol{x}}\mathbb{E}^{n+r}$, $\mathbb{E}^{n+1} \Rightarrow \mathbb{E}^{n+r}$ (2 times)
- Lecture Note page 9, line 5: (resp. $\langle \boldsymbol{x}, \boldsymbol{x}\rangle > 0$) $\Rightarrow$ (resp. $\langle \boldsymbol{x}, \boldsymbol{x}\rangle < 0$)
- Lecture Note page 9, line 3 of Example 3.3: liner $\Rightarrow$ linear
- Lecture Note page 9, the first line of Lemma 3.5: *The subspace* $\Rightarrow$ *For an inner product* $\langle\ ,\ \rangle$*, the subspace*
- Lecture Note page 9, the first line of Lemma 3.5: (*resp.*) $\Rightarrow$ (*resp.* r)
- Lecture Note page 10, line 5 of Definition 3.9: sooth $\Rightarrow$ smooth

Q and A

Q 1: Ex 3-2 を解く過程で，${}^tEAE = A$（注：$E = [\boldsymbol{e}_0, \boldsymbol{e}_1, \boldsymbol{e}_2]$ の式が Ex 3-1 の $(2, 1)$ の定義式と同じであることに気がつきました．^{3} の正規直交基底を並べたものが $(2, 1)$ になるのでしょうか．今後確かめたいと思います．

A: そうです．