UNIVERSITÄT DES SAARLANDES
FACHRICHTUNG MATHEMATIK
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Assignments for the lecture
Introduction to Noncommutative Differential Geometry
Summer term 2019

Assignment 2A
for the tutorial on *Tuesday, May 7, 10:15 am* (in Seminar Room 10)

Exercise 1.

(i) Let E be an n-dimensional (real or complex) vector bundle over a Hausdorff topological space X.

Construct an n-dimensional (real or complex) vector bundle E^* over X, such that for each $x \in X$ the fibre E_x^* of E^* is the dual space of the fibre E_x of E, i.e., $E_x^* = \hom(E_x, \mathbb{K})$.

We call E^* the *dual bundle of* E.

(ii) Let E be an n-dimensional smooth (real or complex) vector bundle over a smooth manifold $\mathcal{M}$. Show that the dual bundle E^* of E is also smooth.