Math 549: Differentiable Manifolds I – David Dumas – Fall 2022

Homework 8

Due Monday, October 24, 2022 at 11:59pm

The same instructions given on homework 1 and 2 apply.

(P1) Problem 9-3 in Lee's book, on page 245. (Explicit computation of some flows.)

(P2) Let $\xi = x\frac{\partial}{\partial x} + y\frac{\partial}{\partial y} + z\frac{\partial}{\partial z} \in \mathrm{Vect}(\mathbb{R}^3)$. For any point $p \in \mathbb{R}^3$ with $p \neq 0$, find a neighborhood U of p and explicit vector fields V, W on U such that (ξ, V, W) is a frame on U and such that $[\xi, V] = [\xi, W] = [V, W] = 0$.

The following problem has been moved to homework 9, so please don't turn it in as part of this assignment:

- Problem 20-5 in Lee's book, on page 536. (Explicit computation of some one-parameter subgroups of $\mathrm{GL}(3, \mathbb{R})$.)

Revision history:

- 2022-10-22 Postpone problem 3