

4. Übung Differentialgeometrie II: Mannigfaltigkeiten

(flows, actions, infinitesimal generator)

Hausaufgaben

1. Aufgabe

(5 Punkte)

1. Sketch for each $n \geq 0$ a flow on \mathbb{S}^1 with exactly n fixed points.
2. Construct a flow on \mathbb{S}^{2n-1} with no fixed point.
3. Sketch a flow on \mathbb{S}^2 with exactly two fixed points, which admits exactly one closed orbit.

2. Aufgabe

(5 Punkte)

We consider the vector field

$$X = x \frac{\partial}{\partial x} + y \frac{\partial}{\partial y}$$

on \mathbb{R}^2 . Is there an \mathbb{R} -action θ for which this is the corresponding infinitesimal generator? If so, then find it!

3. Aufgabe

(5 Punkte)

Show that a bounded vector field on \mathbb{R}^n is the infinitesimal generator of a global flow on \mathbb{R}^n .

Gesamtpunktzahl: 15