

Math 8061 Homework 8

Due Wednesday, 11/15/23

1. Let X and Y be the following vector fields on \mathbb{R}^2 :

$$X = x \frac{\partial}{\partial x} - y \frac{\partial}{\partial y}, \quad Y = y \frac{\partial}{\partial x} + x \frac{\partial}{\partial y}.$$

a) Compute that $[X, Y] \neq 0$.

b) In the last homework, you computed the flows θ of X and ψ of Y . Find explicit times s, t and a point $p \in \mathbb{R}^2$ such that $\psi_s \circ \theta_t(p) \neq \theta_t \circ \psi_s(p)$.

2. Problem 11–6 of Lee.