Suggested exercises for Problem Solving Session 2

MAT 4551 Spring 2019

HW x = Homework number x in the book by Canas da Silva.

- HW 6, Problem 3 b). You may assume that ω_0 and ω_1 induce the same orientation.
- Let (V, Ω) be a symplectic vector space, assume that $W \subset V$ is a coisotropic subspace and that $\Lambda \subset V$ is a Lagrangian subspace. Show that

$$(\Lambda \cap W) + W^\Omega$$

  is a Lagrangian subspace of (V, Ω).
- Let $L \subset (M, \omega = d\lambda)$ be an exact Lagrangian submanifold and let $\phi : M \to M$ be an exact symplectomorphism with respect to λ. Show that $\phi(L)$ is an exact Lagrangian submanifold.
- Let $H : M \to \mathbb{R}$ be a Hamiltonian function of M with 0 as a regular value, put $S = H^{-1}(0)$. Show that the leaves of the characteristic foliation of S are given by the integral curves of the Hamiltonian vector field X_H associated to H.
- HW 8, Problems 1-3.
- HW 9, Problems 1-4.