Test 4

(Take-home)

due to October 12, 10 points in 7 items

Q1. (8 pts) Consider in \mathbb{R}^4 the standard symplectic form $\omega = dx_1 \wedge dy_1 + dx_2 \wedge dy_2$ and the hyperplane $H = \{y_2 = 1\}$.

- (1) Justify that 1-form $\alpha = dy_1 + x_1 x_2$ is a contact form on H.
- (2) Check if ω is not vanishing on the plane field $\xi = \ker \alpha$.
- (3) Find a vector field V such that $i_V \omega = \alpha$.
- (4) Check if V is transversal to H.
- (5) Check if V a Liouville vector field.
- (6) Check if the vector fields ∂y_1 , ∂x_1 and ∂x_2 are contact on H?
- (7) What is the Reeb vector field for α ?