

Homework 10, due Fri.Nov.16 :

Exercise 5.25

Exercise 8.17

Exercise 8.18

Exercise 8.19

Fifth exercise: See definition 8.24 (or some elementary ODE book). Find a specific example of a vector field on the plane  $\mathbf{R}^2$  whose only zero is at the origin and which has index 1 at the origin. Similarly find one with index -1 and one with index 2.

Sixth exercise: See definition 8.21. Find a specific example of a vector field on the unit ball in  $\mathbf{R}^3$  whose only zero is at the origin and which has index 1 at the origin. Similarly find one with index -1 and one with index 2.