

Math 53H: Homework N1

Due to Friday, April 13

Number and sections are given according to the book
V. I. Arnold, Ordinary Differential Equations, 3rd Edition

1. Problems 1, 2 in section 1.1.18.
2. Problem 1 in Section 1.2.6.
3. Problem 1 in Section 1.2.7.
4. Solve the initial value problem for differential equations

$$(e^{-\frac{t}{2}}y + te^{\frac{t}{2}}y)dt + (te^t + 1)dy = 0, \quad y(0) = 1.$$

5. Problem 2 in Section 1.3.2.
6. *Extra credit:* Problem 2 in Section 1.2.7. Show that there exist constants $c, C > 0$ such that the period $T(\epsilon)$ satisfies $c \log \frac{1}{\epsilon} \leq T(\epsilon) \leq C \log \frac{1}{\epsilon}$.

Each (sub)problem is 10 points.