HOMEWORK SET 4

MAT209 · SPRING 2009

You must show all work to get full credit. You can use a calculator to check your work.

Problem 1. Consider the system

$$\begin{aligned} \frac{dx}{dt} &= x - 3y \\ \frac{dy}{dt} &= x + y - 2 \end{aligned}$$

Find all the steady state solutions of this system. Draw the null-clines and all steady state solutions. Analyze the stability of the steady state solutions.

Problem 2. Suppose you attain an average of 73 on three exams during the first half of a course. Five exams are scheduled for the second half. What must your average be on the remaining five exams to finish with an average of 80 for the entire eight exams?

Problem 3. Suppose a data collection S consist of the six numbers $7, 3, 5, 2, 1, 2$.

(a) Find the data value when adjoined to S will give a data set S^* having a mean of 4.
(b) Find the median of the original collection S.
(c) Suppose any number whatsoever (not necessarily a whole number) is adjoined to the collection S, produces a collection S'. Explain why the median for S' differs from the median of S by at most $\frac{1}{2}$.

Problem 4. 50 students take a multiple-choice exam with 10 questions. The number of correct and incorrect answers is recorded for each student. Which of the following values would you consider most likely for the correlation coefficient? Justify your choice.

(a) +1
(b) 0.5
(c) 0
(d) -0.5
(e) -1

Date: March 27, 2009 *Due Date*: Wednesday, April 1, 2009.

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