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## PROBLEM SET

Assignment 3, Part B

Math 5310, Fall 2015

Sept 28, 2015

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- Write all of your answers on separate sheets of paper. You can keep the question sheet.
- You **must** show enough work to justify your answers. Unless otherwise instructed, give exact answers, not approximations (e.g.,  $\sqrt{2}$ , not 1.414).
- This problem set has 1 problems. There are **50 points total**.

Good luck!

**Problem 1.** In each part, assume  $A$  is a  $2 \times 2$  matrix with the given trace and determinant. Consider the system

$$\frac{dx}{dt} = Ax,$$

and describe what kind of fixed point this system has at the origin, without explicitly solving for the eigenvalues of  $A$ .

- 1.)  $\text{tr}(A) = -3, \det(A) = -10$ .
  - 2.)  $\text{tr}(A) = -6, \det(A) = 6$ .
  - 3.)  $\text{tr}(A) = -7, \det(A) = 10$ .
  - 4.)  $\text{tr}(A) = -2, \det(A) = -17$ .
  - 5.)  $\text{tr}(A) = -6, \det(A) = -25$ .
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