Math 308 Quiz 10

Due: Friday, April 19, 2024

Name: _____ **UIN:** _____

Directions: Please upload a PDF file of your solutions on Gradescope by Friday 19 April at 10pm. You may discuss in groups but please submit your own work.

1. Using the eigenvalue method, find the general solution of the following system of differential equations.

   (a) (5 points)

$$x' = \begin{pmatrix} -8 & -1 \\ 16 & 0 \end{pmatrix} x,$$

   (b) (5 points) Classify the equilibrium point from part (a) and sketch a phase portrait.

2. (5 points) Consider the system $x' = \begin{pmatrix} 2 & \alpha \\ 1 & 1 \end{pmatrix} x$. Find the special values of α for which the phase plane changes type. (Assume $\det A \neq 0$).

3. (5 points) For each interval above, choose a representative α and sketch the phase portrait.