Problems Day 54, M 4/29/2024

Topic 27: Linear phase portraits (day 1)

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Problem 1. Suppose A has eigenpairs

$$\begin{array}{rcll} \lambda & = & -3 & -1 \\ \mathbf{v} & = & \begin{bmatrix} 3 \\ 1 \end{bmatrix} & \begin{bmatrix} -1 \\ 1 \end{bmatrix} \end{array}$$

Sketch a phase portrait of the system $\mathbf{x}' = A\mathbf{x}$. Name the type of critical point at the origin and give its stability.

Problem 2. Suppose A has eigenpairs

$$\begin{array}{rcll} \lambda & = & -3 & 2 \\ \mathbf{v} & = & \begin{bmatrix} 3 \\ 1 \end{bmatrix} & \begin{bmatrix} -1 \\ 1 \end{bmatrix} \end{array}$$

Sketch a phase portrait of the system $\mathbf{x}' = A\mathbf{x}$. Name the type of critical point at the origin and give its stability.

ES.1803 Differential Equations

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