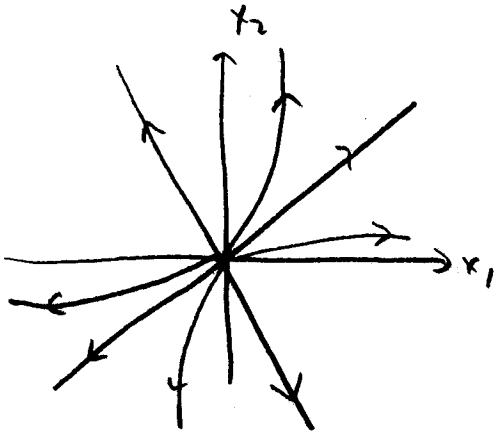
MTHSC 208, Fall 2011

Week 8 summary:

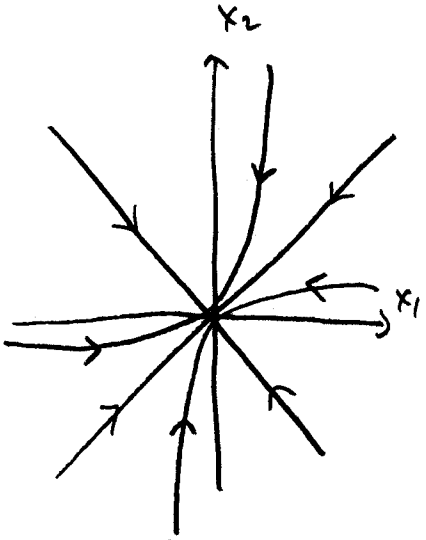
- Phase portraits: Plotting x_2 vs. x_1, where $\vec{x} = \begin{pmatrix} x_1 \\ x_2 \end{pmatrix}$ solves $\vec{x}' = A\vec{x}$.

The "eigenvector lines" contain straight line solutions.

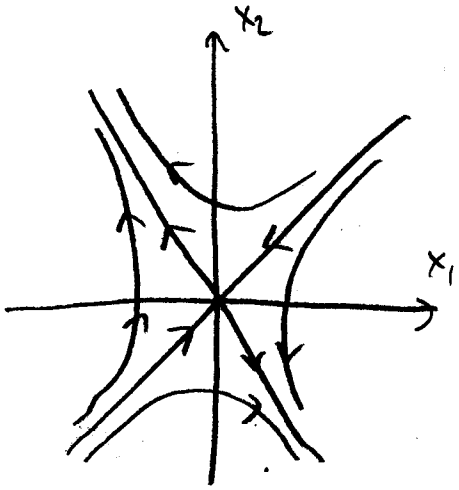
$\lambda_{1,2}$ distinct, real:



$\lambda_1 > \lambda_2 > 0$

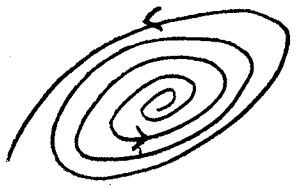


$\lambda_1 < \lambda_2 < 0$

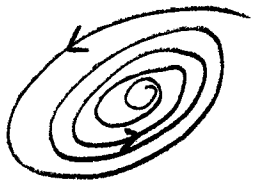


$\lambda_1 < 0 < \lambda_2$

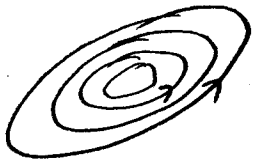
$\lambda_{1,2} = a \pm bi$ (complex):



$a > 0$ (outward spirals)



$a < 0$ (inward spirals)



$a = 0$ (ellipses)