

Week 9 summary:

- Solving $\vec{x}' = A\vec{x}$.

Complex eigenvalues: $\lambda_{1,2} = a \pm bi$

$a > 0$



outward
spirals

$a < 0$



inward
spirals

$a = 0$



ellipses

repeated eigenvalues:

* 1 eigenvector



$\vec{x}_1(t) = e^{\lambda t} \vec{v}$

$\vec{x}_2(t) = e^{\lambda t} t \vec{v} + e^{\lambda t} \vec{w}$

* 2 eigenvectors

(only if $A = \begin{pmatrix} \lambda & 0 \\ 0 & \lambda \end{pmatrix}$)

