Handout 6

Mon. Jun. 15, 2009

The conditions on eigenvalues and eigenvectors giving rise to the 14 types of phase portraits for linear systems.

1. Sink. Two different negative eigenvalues.
2. Saddle. One positive and one negative eigenvalues.
3. Source. Two different possitive eigenvalues.
4. Spiral sink. Complex eigenvalues, negative real part.
5. Spiral source. Complex eigenvalues, positive real part.
6. Center. Complex eigenvalues, zero real part.
7. Sink, special case. Repeated negative eigenvalue, one line of eigenvectors.
8. Source, special case. Repeated possitive eigenvalue, one line of eigenvectors.
9. Sink, special case. Repeated negative eigenvalue, all vectors are eigenvectors.
10. Source, special case. Repeated possitive eigenvalue, all vectors are eigenvectors.
11. No name. One zero eigenvalue and one negative eigenvalue.
12. No name. One zero eigenvalue and one possitive eigenvalue.
13. No name. Repeated zero eigenvalue, one line of eigenvectors.
14. No name. Repeated zero eigenvalue, all vectors are eigenvectors.