Lab 5 Nullclines

For each of the following systems sketch the nullclines. Where possible use these to find and classify the fixed points and sketch the phase portrait. Compare your solutions to the previous Lab. Which method do you prefer – nullclines or fixed points and eigenvalues?

1. Consider a two dimensional dynamical system with up to three fixed points and no closed orbits. What combinations of fixed points are possible?
2. Redo question 4 assuming that close orbits are possible.
3. Draw a phase portrait with three closed orbits and one fixed point.
4. Why is this system known as the parrot system?
5. (Hard) Draw the phase portrait of the following system

Explain…