



It seems to be very hard to prove that there is a trapping region. The following is a sketch, but the details have to be filled-in. The main step is to show that every trajectory that starts in the y -axis (i.e. $x(0) = 0$) and *having* $y(0)$ *large enough*, intersects the red (y) nullcline. Once that this is known, and we have a trajectory as shown in blue in the plot, we follow the arrows to conclude that we must spiral back as shown, until the second crossing of the black (x) nullcline. Now we draw a segment as shown (thick vertical one). As the flow is “SE” on that segment, and the remaining curves are pieces of trajectories, we know that the region bounded by the segment, tail of the blue curve, and magenta curve, is a trapping region.

The choice of $y(0)$ large enough is critical - for example, for the parameters in the book, one needs to pick $y(0) > 0.80437$ or so.

If anyone in class is willing to write a complete proof, I'd be very interested in seeing it!