NOTE: You do not need to provide any graphs.

|  |  |  |  |
| --- | --- | --- | --- |
| Math216, Lab5 |  |  | Section:21/22/23/24 |
| Name: |  | UMID: |  |

1. For the system (1),(2) with b=c=d=1, a=2, do we get limit cycles? YES NO

If so, which point is the center of the cycles? \_\_\_\_\_\_\_\_\_\_

2+3. For r=0.1, do we get a limit cycle around the coexistence point? YES NO   
 If so, is it an attractor or a repeller?

How the eigenvalues around the coexistence point help us to decide?

For r=0.158, it is hard to classify the behavior of the limit cycle. Why?

For r=0.25, do we get a limit cycle? YES NO  
 If so, is it an attractor or a repeller?

4. Answer the question as stated in the lab

5+6+7:

What are the two bifurcation points for a? Assume a1<a2  
a1 = a2 =

|  |  |  |  |
| --- | --- | --- | --- |
| **Fill in the table for (0,0) critical point:** | | | |
|  | a<a1 | a1<a<a2 | a2<a |
| stable or unstable |  |  |  |
| node\spiral\saddle |  |  |  |
| **Fill in for the other critical point:** | | | |
| stable or unstable |  |  |  |
| node\spiral\saddle |  |  |  |