**Name: Cole Bardin Section: 61**

***First Last***

**Q1: Paste your completed phase plot here.**

Be sure the solution for (4,0) is in **magenta** and that for (–4,0) is in **blue**. Be sure the nullclines are visible.

Diagram

Description automatically generated

**Q2:** Write in the exact solution here, including the code used to find it.

%% Q2 - Solve the Homogeneous IVP exactly using dsolve.

**% Add your code here.**

syms y(t)

Dy = diff(y,t); D2y = diff(y,t, t);

DE = 4\*D2y +4\*Dy + 17\*y == 0;

sol = dsolve(DE, y(0)==4, Dy(0)==0)

% The exact solution is:

**Q3: Now evaluate both functions at time *t* = 1. Paste in your values for Y(1) and DY(1) below.**

**Q3: Answer**

>> Y(1)

-0.4581

>> DY(1)

-4.6879

**Q4-5: Paste your completed component and phase plots below for credit.**

A picture containing graphical user interface

Description automatically generated

**Questions 6-7:** Complete the last column in the table below. The last column already includes the homogeneous solution. Just add the particular solution by typing over the **red** dots.

|  |  |  |
| --- | --- | --- |
| **Forcing function** | **Guess for Particular Solution** | **Unique Solution** |
| **a.** |  |  |
| **b.** |  |  |
| **c.** |  |  |
| **d.** | **Bump up!** |  |

**\* Grader will randomly pick two to check for correctness.**

**Question 8:** Now that you have found the particular solution, record its derivative for one point.

**Questions: 9-10: Paste your completed multiplot here.**

Be sure to include the **red** limiting ellipse.

Graphical user interface

Description automatically generated

**Ready to Submit?**

Be sure all ten questions are answered. When your lab is complete, be sure to submit three files:

1. Your **completed Answer Template** as a PDF file
2. A copy of your **MATLAB Live Script**
3. A **PDF** copy of your **MATLAB Live Script** (Save-Export to PDF…)

The due date is the day after your lab section by **11:59pm** to receive full credit. You have one more day, to submit the lab (but with a small penalty), and then the window closes for good and your grade will be zero.