**Answer Template for Lab 4: Custom pplane9 software**

**ENGR 232 – Dynamic Engineering Systems**

**Name: \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ Section: \_\_ \_\_**

*First Last*

**Questions 1-2: Paste your completed phase plot here that you found using pplane8. (2 points)**

Replace the given sample plot.

**Grader:**

**i.** One point if the curves are correct.

**ii.** One point if the colors are correct.

**Questions 3-4-5-6: Custom direction field and solution curves. (4 points)**

**Replace the sample image with your completed graph.**

Grader will award **four** points as follows.

**i.** The tickmarks all have the same length.

**ii.** Solution for (4,–3) is in **red**.

Solution for (8,–6) is in **deep\_purple**.

**iii.** Solutions backwards in time are included.

**iv.** Nullclines are correct.

**Question 7:** The exact solution for **DE: 16** satisfying is:

**(1 point)**



**Questions 8-10: Van der Pol Oscillator (3 points)**

**Questions 8-9-10: Replace the sample plot with your completed solution curves for the Van der Pol Oscillator.**

**Grader:**

**i.** One point for the direction field and title.

**ii.** One point if there are 42 curves, 21 at –5 and 21 at +5.

**iii.** One point if snap-to-grid is working and all the initial points are perfectly, equally spaced vertically.

**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.