Rubric for Project 1- Solving First Order ODEs

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| **Criteria** | **Ratings** | **Pts** |
| Learning Outcome Part I: Graphical Methods Using Slope Field Graphing Software (19 points)  What to submit for  1a: Your written or typed mathematical work showing how you found the equilibrium solutions for each of the two cases. For each case clearly state how many equilibrium solutions you found.  1b, 1c and 1d: Each slope field graph for 1b, 1c and 1d. State in writing for each of 1b, 1c and 1d if the equilibrium solutions you can see in the corresponding slope field are stable or unstable. The equilibrium solutions you see in the graphs should match with the equilibrium solutions found analytically in part 1a.  2: The graph produced of the slope field for the differential equation on the domain from *t* = 0 to *t* = 10. This graph should also include a solution curve with initial value *x*(0)=3.14. | This area will be used by the assessor to leave comments related to this criterion. | 13 pts |
| Learning Outcome Part II: Numerical Methods (9 points)  What to submit for  3: Submit the code used along with one graph from running the code with *n* = 20, one graph with *n* = 40 and one graph with *n* = 200.  4: Submit the code and one graph from running the code. |  | 19 pts |
| Learning Outcome Part III: Analytical Methods (12 points)  What to submit for  5: Submit the code and the MATLAB output from the code.  6: Submit the MATLAB commands used along with the output from the commands and the graph created.   7: Submit the MATLAB commands used along with the output solutions and the graph created. |  | 23 pts |
| Learning Outcome Part IV: Application Problem (15 points)  What to submit for 8a and 8b:   * The differential equation and the initial condition used to model the problem. * A correctly labeled graph of the solution to the initial value problem. * A one sentence description explaining what the graph means. * State what the concentration of the chemical is in the lake after 60 days. |  | 17 pts |
| Total Points: 72 | | |