# Ma 2 practical - Written Homework #1

Due Monday, October 5, 2015 before 4pm

Name (Print):

Please write down the question number at the beginning of your solution. You can use this sheet as a cover.

1. (10 points) Find the equilibrium solution, draw a direction field, for the following equation

   \[ y' = 2y - 3. \]

   Then determine the behavior of \( y \) as \( t \to \infty \).

2. (10 points) Do the same analysis as in question [1] for

   \[ y' = -1 - 2y. \]

3. (10 points) A spherical raindrop evaporates at a rate proportional to its surface area. Write a differential equation for the volume of the raindrop as a function of time.

4. (10 points) Solve the initial value problem

   \[
   \frac{dy}{dt} = -2y + 5, \\
   y(0) = 2.
   \]

   Then determine the behavior of \( y \) as \( t \to \infty \).

5. (10 points) Solve the initial value problem

   \[
   \frac{dy}{dt} = 2y + 10, \\
   y(0) = 2.
   \]

   Then determine the behavior of \( y \) as \( t \to \infty \).

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