Since this is an advanced course in mathematics, you are expected to use more mathematical rigor and demonstrate more mathematical maturity than what might have been expected of you in past courses. You should therefore follow these rules to sharpen your mathematical writing skills. Violating these may result in point deductions.

1. Work each problem to completion first on scratch paper. Once you have solved the problem, then re-write the steps neatly, systematically, and clearly on paper that you will submit. **All** homework should be approached this way.

2. Homework must appear on **one side of the sheet only** (not double-sided).

3. Homework must be written on loose-leaf paper (not spiral notebook paper) with your name and Assignment number printed neatly on the front page. The pages for each individual section must be stapled together and arranged in correct order.

4. Each section (assignment number shown on the course web site) must begin on a new page.

5. Long problems (in this course that's many of them) must begin on a new page.

6. All steps must be written professionally, neatly, and logically. All work must be legible and solutions should proceed logically and clearly **down the page** (not across the page). Sloppy handwriting will result in point loss. Your instructor should not have to struggle to decipher your handwriting or understand your steps. (See Item 1.)

7. Include sentences to explain your steps. Also assign numbers to key equations in your work and refer to them by number. For examples:

   - "We plug this result for Q into Eq. (3) to obtain..."
   - "We solve Eqs. (4) and (7) for u and r to obtain..."
   - "We use Maple (included) to solve Eqs. (8,12,14) for u, T, and P to obtain..."
   - "Starting from Eq. (2.7) on page 89 of the text, we have..."

   Notice that in scientific literature, it is inappropriate to use the personal pronoun "I"; instead, "we" should be used.

8. All steps should be shown for full credit. Many students believe that the ability to skip steps impresses the instructor. On the contrary, detailed, thorough, and systematically written steps impress most instructors. Remember that as the student, it is your responsibility to demonstrate mastery of the material to the instructor. (It is not the instructor's responsibility to mentally fill in your missing steps. Also, the instructor should not have to assume that you know how to get from one step to the next in your write-up.)

9. Correct mathematical notation must be used at all times. This includes but is not limited to:

   (a) proper use of the equal ($=$) sign,
   (b) proper use of the "implies" symbol $\implies$,
   (c) proper use of derivative notation (see example below).

10. Always circle your final answer to each problem.

11. When units are involved, all quantities (not just the final result) must include proper units.

Example: If function f depends explicitly on t, x, and y while both x and y depend explicitly on $t^{\ddagger}$, then the **partial derivative** of f with respect to t is simply

$$\frac{\partial f}{\partial t}, \tag{1}$$

whereas the **total derivative** of f with respect to t is

$$\frac{df}{dt} = \frac{\partial f}{\partial t} + \frac{\partial f}{\partial x} \cdot \frac{dx}{dt} + \frac{\partial f}{\partial y} \cdot \frac{dy}{dt}. \tag{2}$$

There's a BIG difference between (1) and (2). Main point: use d for a total derivative and ∂ for a partial derivative.

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‡In this case we write $f = f(t, x(t), y(t))$.