## Writing Up Workshop Problems

You will be graded on a scale of 0-10 for each workshop problem you turn in. The grade will indicate the correctness of the mathematical content *and the way in which the math is presented in your writeup.* Since you may never have been graded on how you present your ideas in math, here are some guidelines.

Look at one of the examples in the book. The author begins by writing a statement of the problem. He uses complete English sentences. He explains those steps which are not obvious to a calculus student (and he doesn't explain the steps that are obvious). If there is a graph, he labels it, and he discusses what can be deduced from the graph in the text of the example. At the end of the example, he states his conclusion. Use write-ups like this as models for your own work.

Here are two common mistakes you might make. First, you may neglect to make your writeup a coherent, self-contained document. The person reading your writeup (who could be your workshop instructor, your lecturer, your peer mentor or yourself reviewing before an exam) shouldn't have to look back at the workshop sheet to understand your solution. The work should be organized so that the reader can see what steps you are taking and why. On the other hand, you don't have to comment on every step; if you are solving an equation for a variable, say so—don't put a comment for each algebraic step.

The second common mistake is incorrect use of mathematical expressions or notation. Some characters and expressions have special meanings in mathematics. (The most common one to cause problems is "=".) You should use such notation correctly in your write-ups: for example, use "=" between expressions that you mean are all *equal*, but *not* between ones that aren't equal. The following is an example of BAD usage (and mathematical nonsense):

$$0 = x^2 - 1 = x = \pm 1$$

A related mistake is to overuse the symbol $\Longrightarrow$ (the 'implication' symbol) as a substitute for a verbal explanation of what you're doing. In general, you should be able to read the mathematical notation as if it were a sentence (or a paragraph) and have it make sense.

Don't be discouraged if your initial writeups receive low grades because of poor exposition. Writing solutions with explanations is probably not something you have done in a math class before. With the suggestions we will provide and with your effort, you can improve. Because mathematics is used to solve problems *and explain the solutions to others*, writing clear solutions will be a good habit to develop. Creating a good write-up forces you to think more carefully about how you did the problem and therefore helps you learn calculus.

A good write-up is viewable on the Web; go to the course web page

`http://math.rutgers.edu/courses/151-152/151-f01`

and click on "Sample Workshop Write-up".

**640:152:07–09 WEB PAGE:** `http://math.rutgers.edu/~speer/152home.html`