

Journal Instructions

There are (at least) three reasons keeping a math journal is a good idea.

1. It forces you to take a few minutes after class and think about the main ideas. It is easy to get overwhelmed with formulas in math class, so it is important to take the time to pause and think about what the formulas actually do and when they can be used.
2. You are writing your own study guide for the exam a little bit each day. You can know what main concepts are going to be on the exam simply by looking back in your journal. This should keep studying from seeming overwhelming, and by keeping up with your journal every day you are procrastinating less.
3. You have a list of explicit questions you need to learn the answer to before the next quiz or exam. "I don't understand this section" is both a horrible thought and overwhelming feeling. Most of the time, you really do know something; write that down first. Then write down the few things you don't understand. Now you have it narrowed down to a manageable list of things to learn. It is much more productive to attend office hours, help sessions, or tutoring sessions with an explicit list.

Your math journal should be some type of permanently bound notebook (i.e., not loose leaf paper in a binder). There should be nothing other than your journal entries in this notebook. Journals will be collected without warning and graded for completion, so bring your journal to class every day. Make an entry in your journal as soon as possible after each class (while everything is still fresh in your mind). Each entry should contain the following:

- Date
- Section(s) covered
- Two or more sentences describing the main idea(s) covered in class that day. This should be in your own words. Use as few formulas as possible here. Do NOT copy theorems or definitions directly from your notes or textbook.
- At least one question you still have. This could be about the main idea in general, the technique used for a particular example, or how to get from one line to the next in a calculation. Be as explicit as possible here.

While you are working on your homework from that section, feel free to add more questions to your list in your journal.

Example of a bad journal entry: The product rule is

$$(f(x)g(x))' = f'(x)g(x) + f(x)g'(x).$$

I didn't understand the third example.

Example of a good journal entry: Today I learned how to take the derivative of functions that can be written as two functions multiplied together, for example xe^x . It turns out that it is not just the derivatives multiplied together, but it also involves a sum (remember the $x^2 = x * x$ example). The third example was taking the derivative of $\frac{\sin(x)}{x}$. The answer is

$$\left(\frac{\sin(x)}{x}\right)' = \frac{\cos(x)}{x} - \frac{\sin(x)}{x^2}.$$

This looks similar to the product rule since in the first fraction we took the derivative of $\sin(x)$ and left the x alone.

Questions: (1) Where is multiplication? This is division!

(2) Why is it subtraction instead of addition?

(3) Why isn't the second term just $\sin(x)$, since the derivative of x is 1?