

Don't Take Notes, Pay Attention!

Meet Jan

Meet Jan. Jan is an incoming Freshman at Cornell. Jan is a premed and excited to get started along that career path, but distribution requirements... Calculus 1110 doesn't frighten Jan though – Jan was good at math in high school. Thorough notes, and diligence on the homework will pull Jan through, or so Jan thinks.

Jan could be in for a rude awakening. Calculus 1110 is a different beast than high school mathematics – including AP Calculus. Note taking may have been a sufficient strategy in high school – memorize the information, solve the kinds of problems in question, and regurgitate the solution when asked. Calculus 1110 is structured, intentionally, to make such a strategy impossible. There is growing evidence that note taking can actually reduce retention of information for many people. In short, taking notes in class may inhibit how well you understand the material.

In the Math Support Center, we often see students with exceptionally detailed and organized notes. Yet they still have great difficulty understanding what is being asked of them on homework assignments and exams. Our observation is that for many students, taking notes, is an unproductive act of procrastination. Students do not retain information from their time in class — They were too busy paying attention to their notes. This can lead to frustration with the professor for poor presentation, perhaps reduced attendance in class and continued deterioration of success in the class. Read on for a another strategy which may work for you.

Should I Take Notes in Calculus?

Maybe not. You can confidently study from the textbook – there is unlikely to be any secret information the professor presents that is not found in the textbook. Calculus is pretty standard. But, you ask, “How do I learn anything if I don't take notes?!” The answer lies in considering what you are to learn.

If you copy down how a professor solves a problem, you do indeed have a record, which remember has not been proofread, of how to solve that problem. You could probably replicate a solution for that specific problem on a test. This does NOT, however, build skills and strategies. Think about breaking down learning into the following three categories:

1. *Things You Know*
2. *Things You've Memorized*
3. *Tools for Figuring Things Out*

To learn Calculus, **groom** the *Things You Know*, **minimize** the *Things You've Memorized* and **outfit your toolbox** with *Tools for Figuring Things Out*. Calculus is not best learned through memorization – there are more than a zillion things to memorize. That's too many. Strive for a deeper understanding.

Think not:

“I know how to solve this problem because I've seen similar ones before and solved those”

Think instead:

“I know how to solve this problem because I understand what is being asked and what we've learned in the past”.

Q: If I take notes, won't I memorize this “understanding”?

A: Maybe, but there's a lot of information, and Calculus problems can be done more easily and effectively with little or no memorization at all. Understanding, not memorization is the goal in Calculus.

Thanks for sticking with us so far. We've got concrete suggestions for you. Read on...

What Should I do Instead of taking notes?

Calculus is a subject that builds on itself – each piece of the course builds on what came before. In the end, while there are zillions of different questions that can be asked on an exam, the total picture of calculus is ultimately simple, concise, and yes — beautiful!. Instead of taking notes, Pay Attention! Perch yourself on the edge of your seat with the attitude “I'm going to learn this now!” How? Pay attention and follow what is presented on as many levels as possible.

Q: How do I do that? What does it mean to “Follow on as many different levels as possible”?

A: Here are some examples of what it means to **Pay Attention!**

- Learn **in the present, during the lecture.**
 - If something isn't clear, ***ask a question!***
 - If something seems incorrect, ***ask a question!***

The whole class will benefit if you ask a question. You will get your question answered, help insure more clarity during the presentation, and catch the inevitable errors that can occur in any presentation.

- Follow at as many of these “levels” as you can:
 - What are the gory details of the algebra being performed as the problem is being solved?
 - How do those details fit into the arc of the solution?
 - How does this problem involve the topic of the day's lecture?
 - How is today's lecture important to the material
 - for the week?
 - since the last exam?
 - since the start of the semester?
 - How does any of this relate to
 - the homework? (*you **have** looked at the homework, haven't you?*)
 - things I already know?
 - things in other courses I'm taking?

For whatever remains difficult, we at the MSC are here to help you figure it out. Best of luck!

When *Should* I Take Notes, and *What Should They Look Like*?

When is it useful to take notes?

- If there is no textbook, notes can be useful
- Notes may be a primary way to have access to the material after lecture -- remember office hours and the MSC can also help.
- People are different. For some, notes may be a good start to help learn information.
- Remember, though, taking notes:
 - can seriously hinder the opportunity to learn and understand in the moment
 - can make it impossible to pose questions in a timely fashion in class

What should your notes look like?

- Highlights of what is presented:
 - Key definitions
 - Enough to reconstruct the details
- Unexpected results
- Enough to jog your memory to look up in the textbook; on-line; or ask about in the MSC
- Anything that doesn't make sense deserves an in-class question before it goes in your notes.

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There was a young premed in Calc  
Whose notes copied the board full of chalk  
They didn't understand  
Thought the professor was bland  
And complained when their grade took a dock.
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