

How to give a math lecture

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This handout gives a brief guide to giving a math lecture, i.e., a classroom presentation where you are teaching definitions, theorems, proofs, and examples to a class of students.

1. **Write down everything you say.** The main difference between a math lecture and almost any other kind of public speaking you can think of (a literature lecture, a sermon, a political speech) is that **you must write down everything that you say**. This is because, unlike almost any other subject, math generally doesn't have an underlying kind of intuitive sense to it that you can communicate verbally and vaguely without dealing with details. Therefore, anything that you want your audience to understand **must be written down**.
2. **Write it once, say it twice.** As a rule, it often helps your audience if you say what you're going to write as you write it down, and then repeat it once it's already written down. You don't have to do this to a completely mechanical extent, but if you practice this, it should start to become fairly natural.
3. Don't just write down the equations, **write down the words between equations**. This is especially true in a proof class, where the words between the equations and symbols ("for every", "there exists") are almost more important than the equations and symbols themselves.
4. If you are presenting definitions, theorems, and proofs, clearly indicate which is which. It's especially important to separate theorem from proof, and to indicate what you're assuming and what you want to conclude in your proof.
5. Structure your lecture from the top down, like any other kind of oral or written communication. In other words, start with an outline on the highest/broadest level, and then fill in the details.
6. When writing on the board, go from top to bottom, left to right. Don't skip around or proceed in a nonlinear fashion.
7. Avoid large-scale erasing of mistakes if you can, as erasing makes it hard to take notes. Instead, cross things out, or if you do erase, pause for a moment to let people catch up.
8. If you follow all of the above tips, you may start to feel as if you are speaking at an incredibly slow pace and that you are going to grow old and die at the board. If so, you're going at the correct speed to be understood! In fact, slowing yourself down is yet another reason to **write everything down**.