

FRIENDLY ADVICE FOR GIVING MATH TALKS

Nothing that is written here is “correct” in any absolute sense.

1. PREPARATION

- (1) Determine the audience for your talk. Typically, this is one of:
 - (a) Research group within department
 - (b) Department seminar
 - (c) Research group at other universities (conference)
 - (d) Non-specific Math audience (colloquium/expository talk)
 - (e) Interview panel (job talk)

What I say here is meant for a one-hour talk for (c), but some rules will be more broadly applicable.

- (2) Decide the type of talk. Thumb rule is
 - Board talk for (a) and (b).
 - Beamer talk for (c), (d) and (e).
- (3) Choose a title and abstract of your talk. Both should be short but informative.
- (4) Outline of your talk should be:
 - (a) Motivation
 - (b) Definitions and Examples
 - (c) Existing results
 - (d) Your results
 - (e) Examples and Applications
 - (f) Conclusion

Depending on the content, you should allocate about 7-8 minutes for each point.

- (5) Use a beamer theme that is clean and easy to read. I recommend the **Metropolis** theme.
- (6) Each slide should
 - (a) Contain no more than two theorem statements (or equivalent).
 - (b) Contain no more than 7-8 lines of well-spaced text.
 - (c) Take between 1-2 minutes each (For a 60-minute talk, prepare ~ 35 slides).
- (7) If you can, include pictures/tables.
- (8) Use colour for emphasis. Don't overdo it though.
- (9) Create 'exit points' - places you can stop in case you are running short on time.
- (10) Proof-read your document. Remove all typos.
- (11) Practice your talk *out loud*. If possible, record it and play it back to yourself.

2. PRESENTATION BASICS

- (1) The main goals of your talk are as follows:
 - (a) Everyone respects you and your work.
 - (b) Everyone thinks they understand more than they do.
 - (c) Some people ($\sim 25\%$) understand and like what you are doing.
 - (d) At least 2-3 people should talk to you about your work after the talk.
- (2) Body Language:
 - (a) Speak clearly, loudly, and slowly. Vary the tone of your voice.
 - (b) Make eye-contact with as many people as possible in the audience. Gauge if they understand or not, and slow down/speed up accordingly.
 - (c) (Maybe) Move around, and use your hands. Be energetic.
- (3) Questions:
 - (a) Field questions in a professional manner. When someone asks something, say that it is a good question (even if it is not), and answer it succinctly without going too much off-track.

- (b) If the question requires a long answer, give a short one, and ask the speaker if it would be ok to discuss it after the lecture (they will always say yes).
- (c) If you are not sure about the answer, say so. Don't try to cover up your ignorance - everyone can see through that, and they will respect you less for trying to do that.
- (d) Use each question to gauge the audience (as in (3) above) and recalibrate your speed/content.
- (4) Never do nasty calculations in public.
- (5) Give time for people to process big ideas. Repeat difficult definitions/ideas every time they show up (write these on the side if you can - for easy reference).
- (6) Use the blackboard sparingly - only to answer questions if needed.

3. THE TALK

Note: For shorter (≤ 30 minute) talks, you may skip the points marked with a *.

- (1) Go the room early. Never ever go late to your own talk.
- (2) Check how to use the computer/projector/pointer beforehand.
- (3) If one of these does not work, politely ask the chair/organizer if it can be fixed. If not, make the best of what you have. *Never* get flustered/angry by this.

3.1. Introduction.

- (1) Introduce yourself (if not already done by the chair)
- (2) Thank the people/person who invited you, and say that you are happy to be at their institution.
- (3) * (Maybe) crack a joke or tell a short story.
- (4) Don't give an 'outline' of your talk by going over the table of contents.

3.2. **Motivation.** This is the most difficult and crucial part of your talk. Ensure that 75% of your audience understands this section.

- (1) Explain how you got interested in the subject. What are the main questions you are trying to solve?
- (2) Introduce ideas in the simplest way possible (this is very hard).

3.3. **Definitions and Examples.** Ensure that 50% of your audience understands this section.

- (1) Start with the basic minimum that you expect most people will know.
- (2) * Follow each definition with one or two examples.

3.4. **Existing results.** Ensure that 25% of your audience understands this section.

- (1) Give credit for each theorem you state.
- (2) Explain each term in the theorem.
- (3) * Don't give a proof, but you could include an illustrative example/idea.

3.5. **Your Results.** Ensure that 10% of your audience understands this section.

- (1) State and explain your results.
- (2) * Without going into technicalities, give an outline of one proof. No more!

3.6. **Examples and Applications.** Ensure that 25% of your audience understands.

- (1) * Two illuminating (but different) examples that illustrates your theorem are enough.
- (2) Do not give complicated counter-examples.

3.7. **Conclusion.** Ensure that 75% of your audience understands this section.

- (1) Repeat the motivation for your results.
- (2) * Explain what you plan to do next (briefly) and any open questions.
- (3) Say that you are free to discuss after the talk if anyone is interested.
- (4) *Do not* go over your allotted time.
- (5) After questions are over, thank the audience for their time.

For more on giving math talks, have a look at Joseph Gallian's "Advice on Giving a Good Powerpoint Presentation" <http://www.d.umn.edu/~jgallian/goodPPtalk.pdf>