

50 tips for preparing and giving math talks

- (1) Find out the expected duration, language and format (board/beamer) of the talk.
- (2) Find out the usual levels and domains of the audience (master students? only one specific research team?).
- (3) Consequently, find out what concepts you can assume to be known *comfortably* by everyone in the audience.
- (4) Identify your goal (showing off? sharing fun unknown stuff?).

- (5) **Reverse tree method:** write the endgoal first, and go backwards and write the necessary preliminaries, until you reach the level of comfort/knowledge of the audience.
- (6) Then order the content of the tree and add examples.
- (7) Finally, prepare the introduction (context, history) and plan to **state the main result** (or a simplified version) **in the first 5 minutes**.
- (8) Write down every mathematical detail in your notes
- (9) If you are unsure of your improvisational/language skills under pressure, write down the spoken parts in advance too (especially for the introduction)
- (10) **Be simple.** Making people understand is a nicer goal than impressing them with difficulty/technicality.
- (11) Use the simplest examples possible. If you can find a common example you will use several times, do so.
- (12) Don't wait too long (max 1-2 definitions) before giving examples to illustrate.
- (13) Proofs are not necessary, technical details even less. Ideas of proofs are better.
- (14) Don't erase crucial notations, definitions, or your endgoal (if the blackboard is big enough).
- (15) Plan in advance where you will write which parts on the blackboard.

- (16) Rehearse in real conditions (write on a blackboard, erase, talk, display the beamer) in front of an audience (at least 1 person).
- (17) Time yourself for each part of the talk, and write down the durations on your notes.
- (18) Leave 5 minutes for in-talk questions. If you went overtime in the rehearsal, **cut some stuff**.
- (19) Identify the most necessary parts of the talk (the motivation, the main example, the endgoal theorem) and how long they take, so you will know what to leave out when if you run out of time during the talk. Mark this clearly on your notes.
- (20) Plan bonus stuff in case you finish too early.
- (21) The *most irritating part* of a talk for the audience is the speaker going overtime. **Never go overtime.**
- (22) Don't be frustrated if you run out of time for the last part because there were many questions. A lot of questions mean either that preliminaries were not clear enough (thus if they had been explained longer and more clearly, you would still not have enough time) or that people were very interested (and so your talk is already a success).

- (23) Presenting your results at a seminar/conference = a teaser for your pre-print.
- (24) Precise the authors and dates of each statement, including yours.

- (25) In a workshop/reading group/graduate seminar, when you present something new for you, don't blindly follow the source material.
- (26) First understand the results without thinking of the talk, find examples that you like.
- (27) Then transmit your point of view on the results.

- (28) For a PhD defense in Geneva, there are no general rules, discuss it with your advisor well in advance.
- (29) Give context, be selective, be simple.
- (30) Try to make the beginning understandable for non-mathematicians.

- (31) Beamer's advantages: pictures, videos, faster than writing on the blackboard.
- (32) Beamer's drawbacks: people forget the previous slides, you risk talking too fast, or staying too static.
- (33) Beamer's min-max: for each slide, **at most 7 lines of text**, at most 1 idea, at least 1-2 minutes of speaking.
- (34) Beamer's other commandments: write key words, avoid reading the exact sentences, use bold/color/emphasis.
- (35) Equipment: long stick is better than laser pointer (laser dot is small or makes audience dizzy), printout notes for you, printouts of details for the audience.
- (36) Use both Beamer and the blackboard.
- (37) Before the talk, test everything in the room (computer, screen, lights, blackboard). Colors/sounds are tricky, they might not come out well.

- (38) Speak loudly enough, increase the volume at the end of a sentence.
- (39) Face the audience, don't talk to the blackboard.
- (40) Don't speak more than 1-2 technical sentences in succession, write.

- (41) Ease stress with breathing exercises.
- (42) In doubt, slow down and speak louder.
- (43) The worst possible audience reaction is indifference, not hatred (except for overtime).

- (44) Taking 10 seconds to think before answering a question is OK.
- (45) Be honest when you don't know an answer.
- (46) Don't deprecate yourself or your results, be positive.
- (47) Take back control of the talk if questions digress too much.

- (48) After the talk, write down the questions from the audience, they will be useful for future talks/research.
- (49) If you want to get even better, ask for specific feedback or negative feedback.

- (50) Have fun :)