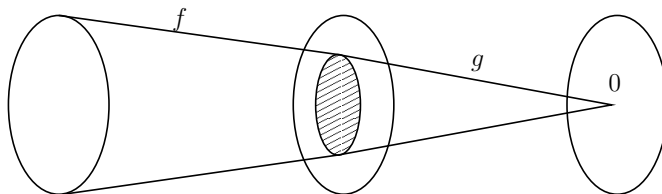


TEACHING STATEMENT, MELODY CHAN

Teaching mathematics is very important to me. I have several main goals when I teach: clarity and organization, encouragement and involvement, and mentorship.

My first priority in teaching is simply to communicate mathematical concepts with utmost **clarity**. I strive to make what I write on the blackboard a clear and organized account of the material. I write in full sentences whenever possible. In particular, I always start each sentence with an English word, like “if,” “given,” or “then,” not a mathematical symbol. This strategy helps to keep the logical flow of the lecture as transparent as possible, so that students are perfectly clear as to whether we are setting $x = 0$ or supposing that $x = 0$ or concluding that $x = 0$, for example. Second, I verbally flesh out what I write with a more conversational and intuitive explanation of the ideas. I am also a big fan of well-thought-out pictures. For example, I was a teaching assistant at the MSRI summer school on cluster algebras, which included a crash course on homological algebra. In explaining what it means for a sequence $M' \xrightarrow{f} M \xrightarrow{g} M''$ to be exact, I found that going over the definition in words was not quite so helpful for students who already felt lost in a sea of symbols. Instead, drawing $\text{Im}(f) = \ker(g)$ as the shaded area in the following picture helped some students immensely.



I have received much positive feedback on my class lectures as well as my seminar talks, in which I try to follow the same principles of clarity and organization.

Another component of teaching that I value greatly is **generating a sense of excitement and relevance**; this applies to undergraduate classes in particular. One way to achieve that goal is to constantly communicate, through tone and delivery, my own enthusiasm for the subject. I also like to emphasize real-world examples. Conversely, connecting the course content with real-world experiences can help students master it. For example, noting that “go straight, then turn right” and “turn right, then go straight” really achieve different things can help students digest the concept of noncommutativity, allowing them to see it less as a silly mathematical invention and more as something that comes up unavoidably in nature. Using many examples is a technique that I see as especially beneficial in office hours, working with students who are struggling on a more basic, conceptual level, and in a setting that allows for more lengthy discussion.

As an undergraduate, I once had a professor tell us: “The only ideas undergraduates really remember are the ones that come out of your own mouths.” I believe there is a kernel of truth to that statement, and I am also certain that being able to present an idea in a rigorous and organized way is a crucial skill, both in mathematics and outside it. As

such, I strongly emphasize **group work and structured class participation**. If I have the opportunity to teach a small undergraduate class, I would ask each student to do a 10-minute presentation on some subject related to the course material. I would make sure to supplement that assignment with out-of-class support, comprising suggestions for topics that interest each student and help with how to give a math talk.

Finally, I am deeply committed to **mentorship** and view it as an important part of teaching. Supporting young women in math is especially important to me. I have a strong record of mentoring: at UC Berkeley, I co-organize a student-run mentoring program for first-year graduate students in math that has served 64 students over the past two years. Through the Noetherian Ring at UC Berkeley, a group for women in mathematics, I also mentor an undergraduate student, Paige Buck-Moyer, who is currently applying to graduate schools. I also co-organized a student seminar in discrete mathematics, one of the purposes of which was to give younger students a chance to practice giving talks. I am very committed to supporting students both in and out of the classroom through clear and organized lecturing, encouragement and involvement, and espousing a comprehensive view of mathematical mentorship.