When I was in high school, math courses were the ones that I enjoyed the most. Many of my fellow students did not enjoy math, and struggled to understand the concepts. Years later in college I observed the same phenomenon. After looking for an explanation, this is what I found: I was lucky to have math professors that enjoyed teaching, and that taught us how to reason through problems instead of just memorizing formulas. One of my primary goals in teaching is to help students develop the reasoning skills they will need to solve mathematics problems. In mathematics, there are formulas we need that are hard to remember. Instead of acting as a computer by memorizing formulas and plugging in data, I remind my students of the need to think about how the formulas were derived. Doing so will help them discover the process to solve the problem. For example, I have noticed that students have trouble remembering all the properties of logarithms. I ask them to remember only one \((\log(AB) = \log(A) + \log(B))\), and teach them how to derive the rest of the properties based on the first one. This helps students understand that mathematics is not about memorizing formulas, but about reasoning. Then, in the next quiz I ask them to explain how to derive those properties.

I find that interactive learning is a wonderful tool in teaching mathematics. Once a week I start my class with a short quiz, and remind my students what they need to read or do before the next class. When I return the quizzes, I go over the hard problems by asking students to solve them at the board together with me. This gives students the opportunity to see why they were wrong, and also gives me the opportunity to check their reasoning. Next, I give a mini-lecture over the material for that class, and immediately after, I ask them to work on problems in groups of four or five. I walk around to answer questions, and then ask different groups to solve the problems at the board. I always emphasize that making mistakes is part of the learning process. This method shows them that they need to be able to answer questions, and helps them feel comfortable expressing their answers.

Another goal in my teaching is to have students collaborate with others by working in groups. Students remember more about what they actually do rather than what they hear from the professor. This is why practice in mathematics is crucial. I believe that the most effective way to learn is by interacting with others and so I encourage group work. Besides the group work in class, I assign team homework every week, on which students work together on mathematical problems and turn in one set of solutions per group. I highlight the importance of working in groups, not only in mathematics, but also in their future jobs. When a conflict arises, I ask them to solve it as a group. For instance, if a member was not notified of a meeting, I talk to the group and ask them what process do they have to arrange the meetings. This help them develop the skills they need to interact with others to achieve their objectives.

Finally, another major goal of my teaching is to create an inclusive and friendly environment. Isolated students are likely to fall behind. I try to move them around by assigning different teams periodically. I encourage participation by creating a friendly environment in which students are not afraid to make mistakes at the board. I tell them that every one makes mistakes, and I try to improve communication between us by inviting them to ask me questions and correct possible mistakes that they may see in the board. I find this very helpful because it makes me accessible and it helps me understand how they think about the topics that they are learning. When I identify students who have difficulties learning the material, I encourage them to come to office hours, or arrange special appointments if needed.

I enjoy math a lot, and I also enjoy teaching it to others. This is reflected in my enthusiasm when I am in the classroom. This helps me a lot, since students find it more interesting when the instructor is also interested. I hope this encourages students to have a good felling about mathematics, so that they may learn the most about this beautiful and important science.

http://www-personal.umich.edu/~gerahdez