Teaching Statement

Maria Belk

I have been teaching mathematics for ten years, first as a graduate student at Cornell, then as a postdoc at Texas A&M, and now at Bard College. Before coming to Bard, I had taught second semester calculus, linear algebra, differential equations, and graduate engineering mathematics. At Bard, I have taught precalculus, second semester calculus, and graph theory. In addition, I have designed and taught two 2-credit math skills review courses for students who need additional algebra or precalculus practice.

In my teaching, I try to interest the students by providing motivation and concrete examples. For example, in calculus, when I discuss how integration can be used to compute volume, I bring a model of a truncated pyramid to class to provide a concrete example for the students. I try to introduce motivations early. At the beginning of the sequences and series section of calculus, I discuss the usefulness of polynomials, and I explain that series will allow us to write some functions as “infinite polynomials.” In precalculus, I motivate most of the topics with real world applications—for example, I show the students how trigonometry is used to find the heights of buildings, and how Erostothenes used trigonometry to find the radius of the Earth.

I try to encourage student participation in class. When working a problem in class, I often stop and ask the students for ideas on how to proceed. In graph theory, after introducing a new definition, I have the students work a couple examples, and then make some conjectures. In precalculus and calculus, I sometimes begin class with a “warm-up problem”—the students spend five to ten minutes working on the problem, and then we discuss the solution to the problem. This immediately engages the students, and allows them to test their understanding of the material from the previous class.
This past semester, I designed and taught two 2-credit math skills review courses: ARC 150 (algebra workshop) and ARC 190 (precalculus workshop). The algebra workshop is taken by students who entered Bard with a weak algebra background. These students take the algebra workshop either while taking a math/computing course or in preparation for a math/computing course. The precalculus workshop is taken by students who have taken a precalculus course, but need additional practice. These students often take the workshop while taking calculus or in preparation for taking calculus. In both of these classes, the students mostly need additional practice with the material. I spend half of class time lecturing, usually reviewing a topic that the students have previously seen. During the second half of class, the students work on worksheets. This format seemed to work well, and the students’ algebra and precalculus skills improved during the course.

I find that students benefit from working collaboratively on mathematics problems. By working in groups, the students who understand the material benefit by explaining the material to others. In addition, for students who are nervous about their math ability, talking to other students and realizing that they have the same difficulties as the other students, can greatly increase their confidence with math. In the algebra and precalculus workshops, I encourage the students to work in groups on the worksheets; and in all of my classes, I encourage students to work in groups on homework problems.

I have thoroughly enjoyed my experiences with helping students learn mathematics. In my teaching, I have tried to make the material interesting and understandable to the students, to help the students have confidence in their mathematical abilities, and to show the students that mathematics can be fun. I hope to continue to discuss interesting mathematics with students throughout my career.