

Unit Guide

Providing Opportunities for Students to Reason, Justify and Prove in the High School Calculus Class

Michelle Northshield

This curriculum unit focuses on developing a clear understanding of the characteristics of writing viable arguments or proofs in a high school calculus course. The unit is designed to be used throughout the year as students' progress through the calculus curriculum. The idea is that by engaging students in a scaffolding of activities that are arranged by level of difficulty and topic, students will begin to understand the idea of writing out their complete thought process and begin to develop skills that allow them to critique the work of their peers. The unit begins on day one of the school year with posing problems to students that require only basic algebra skills, yet ask for a proof. Students will dive right in to the concept of proofs and will begin to see that writing a proof requires more than just checking to see if something works for a few select cases. After the initial days of algebraic proofs, students will be introduced to the three different methods of proof, including Mathematical Induction, along with a brief history of proofs. The final portion of the unit allows students to take on the more rigorous epsilon-delta proofs for limits and includes written proofs that contain errors for students to correct. By having students partake in opportunities that allow them to reason, justify and prove throughout the year, students will gain a deeper understanding of constructing viable arguments.