

A Visualization of Vectors and Trigonometry

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Abstract

After introducing students to trigonometry, most precalculus courses then follow with applications, including an introduction to vectors. Most of our students are engineering majors and have seen the concept of a vector in engineering courses or physics courses. They understand the idea of using vectors to represent certain physical quantities. However, with calculus looming for these students, I like to combine three concepts into one:

1. Continue to bolster students fluency in trigonometry,
2. Define and demonstrate vectors and vector operations, and
3. Demonstrate a mathematical proof using vectors and trigonometry.

The proofs are visual and follow the basic properties of vectors, operations with vectors, and dot product (in two dimensions of course).