

Uses of Euler's Formula in College Mathematics Courses

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Abstract

Although Euler's formula for the complex exponential can be useful in mathematical derivations, it is underused in the mathematics curriculum. We describe examples where it can provide a convenient method to find answers and one that is sometimes simpler than what is usually given in textbooks or taught in classes. Some of these examples come from courses that are taken before students have studied any calculus. Mathematics teachers should consider introducing Euler's formula soon after students have learned about complex numbers and sine and cosine. They could then use it as needed in mathematical calculations. Science and engineering students may encounter the complex exponential in advanced applications, so its early introduction would benefit those students by giving them greater familiarity with it.



Ian Christie comes from Edinburgh, Scotland. In 1978, he received a PhD in mathematics from the University of Dundee, specializing in the numerical solution of partial differential equations. He has been a professor of mathematics at West Virginia University (WVU) since 1983. His research involves the application of numerical methods to problems arising in science, engineering, and medicine. He also has a strong interest in undergraduate mathematics education and was director of the undergraduate program in mathematics at WVU for many years.