

nth Root of Complex Numbers: a Recursive Solution

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Abstract

Roots of complex numbers were first introduced by Bombelli with his work involving cube roots. Using De Moivre's Theorem (Weisstein, 2015), others have been able to find general formulas for different roots of complex numbers by converting the complex number into a polar coordinate. The main accomplishment of this paper is a recursive formula for generating the 2 to the nth root of a complex number. This function can give the 2nd root, 4th root, 8th root, etc. The paper begins with a focus on cube roots of complex numbers and their issues, then delves into 2nd, 4th, and 8th roots before unifying them under one equation. Some sign issues with the formulas will also be highlighted. The recursive formula could expand our understanding of complex numbers and push others towards new approaches to complex numbers.