

Exploring the Number e.

Calculus

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Abstract:

The number e is a very important number in mathematics and is equal to 2.718281828459045... . The discovery of the number e led to many discoveries in the sciences and technological developments the humankind enjoys today. While most people are more familiar with the number π , many are unfamiliar with the number e .

One of those discoveries is the famous Euler identity $e^{i\pi} + 1 = 0$ involving all five important mathematical numbers ($e, \pi, i, 1, 0$) in mathematics. In this work, the number e will be explored showing its history, some applications like compound interest, some of its properties and its approximations. Some identities will be proven in approximating the number e as well as the graphing tool MATLAB will be utilized to graph certain functions like $(1 + 1/x)^x \rightarrow e$ as $x \rightarrow \infty$ involving the number e .