Is Benford's Law Irrational?: Does Benford's Law Apply to the Decimal Digits of Irrational Numbers?

Olmstead, Abigail (School: Greater Waco Christian Home Educators)

Benford’s Law is a mathematical law that dictates the percentages of the appearances of initial digits 1-9 in a naturally occurring data set with no limits. This experiment tested to see if the distribution of the decimal digits of naturally occurring irrational numbers followed Benford’s Law. 1,000 decimal digits each of Phi, Pi, and Euler’s Number were used to test the hypothesis. The decimal digits, however, followed a completely random distribution, according to a Chi-square test. This could suggest another way to describe the decimal digits of irrational numbers, in addition to their lacking termination and patterns. Even though the decimal digits tested were derived from naturally occurring ratios, Benford's Law can not be applied to their distribution.

Awards Won: