Niels Fabian Helge von Koch Biography

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Biography

Commonly known by the name Helge, Niels Fabian Helge von Koch is best remembered for devising geometrical constructs that are now called the Koch curve and the Koch snowflake (or star). He was also an expert on **number theory** and wrote extensively on the **prime number theorem**.

Von Koch, the son of a career soldier, was born in Stockholm, Sweden on January 25, 1870. After completing his early education in that city in 1887, he went on to study at the University of Stockholm. There he had the opportunity to study under **Gosta Mittag-Leffler**, who was the school's first mathematics professor.

In 1888 von Koch took some classes at Uppsala University, where he worked on linear **equations**. His first major paper, published in 1891, was on the application of infinite **determinants** to solving **differential equations** with analytic coefficients.

Von Koch earned his doctorate in mathematics from the University of Stockholm in 1892, writing a thesis that would contribute to the development of functional **analysis**. In 1893 he accepted a job as assistant professor of mathematics at an unknown school (perhaps the University of Stockholm). He had several such low-ranking appointments between then and 1905, and suffered another disappointment when he was turned down as chair of number theory and **algebra** at Uppsala University. However, in 1905 von Koch finally achieved a promotion when a colleague resigned his professorship at the Royal Technological Institute in Stockholm. The school offered von Koch the chair of pure mathematics, which he promptly accepted.

In 1901, von Koch published *On the Distribution of Prime Numbers,* which concentrated on the prime number **theorem**. In 1906, he released his work on curves and snowflakes. The von Koch curve is made by taking an equilateral **triangle** and attaching another equilateral triangle to each of the three sides. This first **iteration** produces a Star of David-like shape, but as one repeats the same process over and over, the effect becomes increasingly fractal and jagged, eventually taking on the traditional snowflake shape. The snowflake is actually a continuous curve without a tangent at any point. Von Koch curves and snowflakes are also unusual in that they have infinite perimeters, but finite areas.

After writing another book on the prime number theorem in 1910, von Koch succeeded Mittag-Leffler as mathematics professor at the University of Stockholm in 1911. He died in Stockholm on March 11, 1924, having taught for most of the remainder of his life.