

Math Mole

July 8, 2009

Work Day

Volume 5, No. 3

This issue

- Mathematician of the Day
- Quote
- Puzzles
- Today's Editor: Shashank
- Thursday: Daniel

Quotes:

Truth is much too complicated to allow anything but approximations. – John von Neumann

There's no sense in being precise when you don't even know what you're talking about. – John von Neumann

Puzzles:

Perfect Square: Find the sum of all positive integers n for which $n^2 - 19n + 99$ is a perfect square.

Magic Square: In a magic square, the sum of the three entries in any row, column, or diagonal is the same value. The figure shows four of the entries of a magic square. Find x .

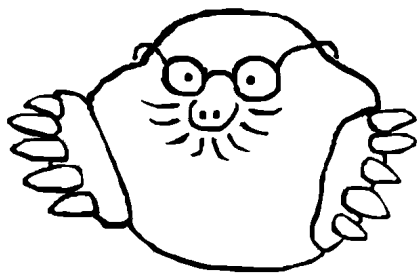
x	19	96
1		

Mathematician of the Day



John Louis von Neumann, 1903-1957, Hungary

- The eldest of three brothers, von Neumann was born Neumann János Lajos in Budapest, Hungary, on December 28, 1903, to a wealthy non-practicing Jewish family. He was a child prodigy who showed an aptitude for languages, memorization, and mathematics. Although he attended school at the grade level appropriate to his age, his father hired private tutors to give him advanced instruction in these areas.
- He received his Ph.D. in mathematics (with minors in experimental physics and chemistry) from Pázmány Péter University in Budapest at the age of 22. Between 1926 and 1930, he taught as a privatdozent at the University of Berlin, the youngest in its history. By age 25, he had published ten major papers, and by 30, nearly 36.
- In 1930, Neumann was offered one of the first four faculty positions at the Institute for Advanced Studies. Two of the others were Albert Einstein and Kurt Gödel.
- Von Neumann wrote 150 published papers in his life; 60 in pure mathematics, 20 in physics, and 60 in applied mathematics.
- Less than a month after Gödel published his first incompleteness theorem, von Neumann showed as a corollary that axiomatic systems are unable to demonstrate their own consistency. This is likely one of the most important implications of Gödel's theorems.
- Von Neumann produced the first axiomatic system of Quantum Mechanics in 1932 based on representation in Hilbert Space. This system, although considered elegant, was rejected in favor of one derived by Paul Dirac because it was considered too abstract for application in physics. However, it still permitted later scientists to approach Quantum Mechanics from other angles, and resulting in the derivation of Bell's Theorem and a simpler derivation of Heisenberg's Uncertainty Principle.
- In 1944 and 1945, von Neumann worked in Los Alamos on the development of the atomic bomb. He showed, among other results, that it would be more effective to detonate the bomb at a height of a few kilometers rather than at ground level and witnessed firsthand the Trinity test. He later worked on the process of thermonuclear chain reaction with Edward Teller.



Math Mole

July 6, 2009

Late Version

Volume 5, No. 1

This issue

- Mathematician of the Day
- Quote
- Puzzles
- Today's Editor: Hunter

Quotes:

In mathematics, you don't understand things. You just get used to them. – Johann von Neumann

Arithmetic is being able to count up to twenty without taking off your shoes. – Mickey Mouse

Mathematics consists in proving the most obvious thing in the least obvious way. – George Polya

Puzzles:

Four Nines: Use four 9's in a math equation to equal 100.

Two Doors, Two Guards: You are trapped in a room with two doors... One door lead to certain freedom and the other leads to a ton of worms that you'll have to eat. You don't know which door goes to the worms and which door gets you out. There are two guards in the room. One guard always tells the truth and the other guard always lies. You don't know which one is honest and which one is the liar. If you just guessed, you'd have a 50-50 shot. To figure out which door to choose, you get to ask one guard one question What is your question and which guard will you ask?

Mathematician of the Day



John Louis von Neumann, 1903-1957, Hungary

- The eldest of three brothers, von Neumann was born Neumann Janos Lajos (in Hungarian the family name comes first) in Budapest, Hungary, to a wealthy non-practicing Jewish family.
- Janos, nicknamed "Jancsi" (Johnny), was a prodigy who showed aptitudes for languages, memorization, and mathematics.
- He received his Ph.D. in mathematics (with minors in experimental physics and chemistry) from Pázmány Péter University in Budapest at the age of 22.
- In 1938 von Neumann was awarded the Bocher Memorial Prize for his work in analysis.
- von Neumann introduced a method of demonstration (called the method of inner models) which later became an essential instrument in set theory.

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