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THE FIRST RESOURCE FOR MATHEMATICS

du Sautoy, Marcus

∞. A very short introduction to infinity. Translated from the English by Sigrid Schmid. (∞. Eine sehr kurze Einführung in die Unendlichkeit.) (German) Zbl 1489.00006

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Starting from the fact that also animals can have some basic notion of counting to estimate the number of enemies, even if it is only 1, 2, 3, many, it is shown that larger quantities can still be compared by pairing elements of the two sets. For example pairing sheep with pebbles or with the set of numbers $1, 2, 3, \ldots$ Using the metaphor of Hilbert's hotel and Cantor's diagonal principle, it is explained to the layman that there are as many rational numbers as there are natural numbers, but that the cardinality of the set when irrational numbers are added is much larger. The most mathematically involved part is where irrational numbers are introduced and it is shown that an infinite sum can still give a finite result, but otherwise no mathematics are needed.

Reviewer: Adhemar Bultheel (Leuven)

MSC:

00A09 Popularization of mathematics

Keywords:

counting; infinity; Hilbert's hotel; rational numbers; irrational numbers; countable; cardinality

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