



Taylor & Francis
Taylor & Francis Group



Proof without Words: The Arithmetic Mean-Geometric Mean Inequality

Author(s): Doris Schattschneider

Source: *Mathematics Magazine*, Vol. 59, No. 1 (Feb., 1986), p. 11

Published by: Taylor & Francis, Ltd. on behalf of the Mathematical Association of America

Stable URL: <https://www.jstor.org/stable/2690011>

Accessed: 18-09-2024 22:50 UTC

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <https://about.jstor.org/terms>



JSTOR

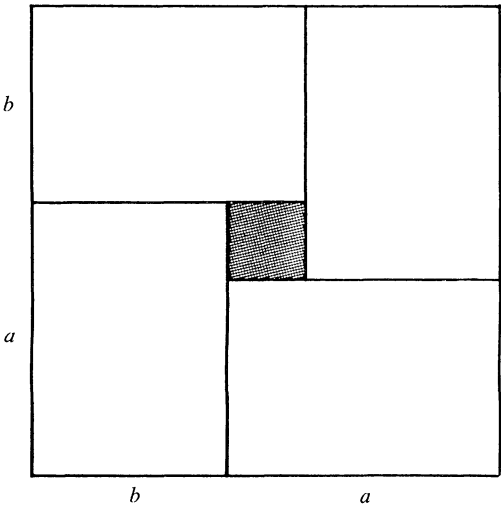
Taylor & Francis, Ltd., Mathematical Association of America are collaborating with JSTOR to digitize, preserve and extend access to *Mathematics Magazine*

I am grateful to the editors and a referee for their help in the preparation of this article and to Brian Winkel for valuable information and advice. I offer much-belated thanks to Chuck Oravec for introducing me to Kahn's *The Codebreakers*.

References

[1] H. Beker and F. Piper, *Cipher Systems: The Protection of Communications*, John Wiley and Sons, 1982.
[2] *Cryptologia*, Rose-Hulman Institute of Technology, Terre Haute, Indiana.
[3] W. F. Friedman, *The Index of Coincidence and Its Application in Cryptography*, Riverbank Laboratories, Publication No. 22, Geneva, Illinois, 1922.
[4] _____, Jules Verne as cryptographer, *Signal Corps Bull.*, (1940) 70–107. This article is reprinted in *Cryptography and Cryptanalysis Articles*, v. 2, Aegean Park Press, Laguna Hills, California, 1976.
[5] H. F. Gaines, *Cryptanalysis*, Dover, New York, 1956.
[6] Martin Gardner, A new kind of cipher that would take millions of years to break, *Scientific American*, 237 (1977) 120–124.
[7] C. W. R. Hooker, The Jules Verne cipher, *The Police Journal*, London, 4 (1931) 107–119.
[8] David Kahn, *The Codebreakers*, Macmillan, New York, 1967.
[9] _____, *Kahn on Codes*, Macmillan, New York, 1983.
[10] S. Kullback, *Statistical Methods in Cryptanalysis*, Aegean Park Press, Laguna Hills, California, 1976.
[11] A. Lempel, Cryptology in transition, *ACM Computing Surveys*, II (1979) 280–303.
[12] A. Sinkov, *Elementary Cryptanalysis—A Mathematical Approach*, The New Mathematical Library no. 22, Mathematical Association of America, Washington, D.C., 1968.
[13] Jules Verne, *Voyage au Centre de la Terre*, Hetzel, Paris, 1864. *Journey to the Center of the Earth*, Dodd, New York, 1984.
[14] _____, *La Jangada*, Hetzel, Paris, 1881. *Eight Hundred Leagues on the Amazon*, Didier, New York, 1952.
[15] _____, Mathias Sandorf, Hetzel, Paris, 1885. *Mathias Sandorf*, Hachette, Paris, 1979.

**Proof without words:
The arithmetic mean–geometric mean inequality**



$$(a + b)^2 - (a - b)^2 = 4ab$$
$$\frac{a + b}{2} \geq \sqrt{ab}$$

—DORIS SCHATTSCHNEIDER
Moravian College