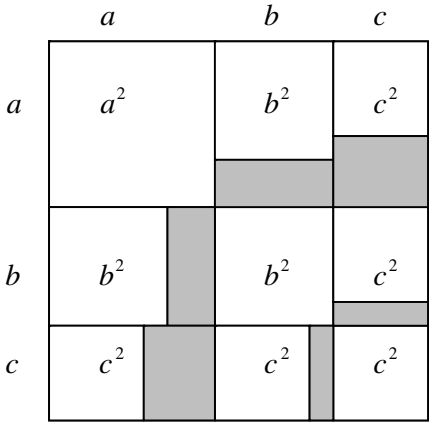
20. D. Rees, On semi-groups, *Proc. Cam. Phil. Soc.* **36** (1940) 387–400.
21. B. M. Schein, Obituary: V. V. Vagner (1908–1981), *Semigroup Forum* **23** (1981) 189–200.
22. B. M. Schein, Prehistory of the theory of inverse semigroups, *Proceedings of the 1986 LSU Semigroup Conference (Kochfest 60)*, Louisiana State University, Baton Rouge, LA, 1986, 72–76.
23. I. Stewart, Four encounters with Sierpiński's gasket, *Math. Intell.* **17**(1) (1995) 52–64.
24. A. K. Suschkewitsch, Über die Darstellung der eindeutig nicht umkehrbaren Gruppen mittels der verallgemeinerten Substitutionen, *Mat. Sb.* **33** (1926) 371–374.
25. A. K. Suschkewitsch, Über die endlichen Gruppen ohne das Gesetz der eindeutigen Umkehrbarkeit, *Math. Ann.* **99** (1928) 30–50.
26. V. V. Wagner, Generalized groups, *Dokl. Akad. Nauk SSSR* **84** (1952) 1119–1122 (Russian).

Proof Without Words: An Algebraic Inequality

Problem 12 of the Leningrad Mathematics Olympiad, Grade 7, second round, 1989.

Let $a \geq b \geq c \geq 0$, and let $a + b + c \leq 1$. Prove $a^2 + 3b^2 + 5c^2 \leq 1$.



$$a^2 + 3b^2 + 5c^2 \leq (a + b + c)^2 \leq 1.$$

Similarly, if $a_1 \geq a_2 \geq \cdots \geq a_n \geq 0$, and $\sum_{i=1}^{n} a_i \leq 1$, then

$$\sum_{i=1}^{n} (2i - 1)a_i^2 \leq 1.$$

With $n = 2004$, this is problem 2 of the 2004 AMOC Senior Contest [**1**].

REFERENCE

1. Hans Lausch, An Olympiad problem appeal, *The Australian Mathematical Society Gazette* **34**(2), 2007, 90–91.

Wei-Dong Jiang
Department of Information Engineering
Weihai Vocational College
Weihai 264200, Shangdon Province
P. R. China
jackjwd@163.com