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SYNOPSIS

Let ABC be any triangle with side lengths a, b, c, and area S. The Hadwiger–Finsler Inequality states that

$$a^2+b^2+c^2 \;\geq\; 4S\sqrt{3}+(a-b)^2+(b-c)^2+(c-a)^2\,.$$

The authors refine this inequality to the following:

$$a^2+b^2+c^2 \;\geq\; 4S\sqrt{3+\frac{4(R-2r)}{4R+r}}+(a-b)^2+(b-c)^2+(c-a)^2\,.$$

They then present a number of applications.

Enjoy!!

This month's "free sample" is:

3318. *Proposé par D.E. Prithwijit, University College Cork, République d'Irlande.*

On suppose que les hauteurs AD, BE et CF d'un triangle ABC coupent respectivement le cercle circonscrit aux points X, Y et Z. Montrer que

$$\frac{AX}{AD}+\frac{BY}{BE}+\frac{CZ}{CF} \;=\; 4\,.$$

. . . .

3318. *Proposed by D.E. Prithwijit, University College Cork, Republic of Ireland.*

The altitudes AD, BE, and CF of $\triangle ABC$ are produced to meet the circumcircle at X, Y, and Z, respectively. Prove that

$$\frac{AX}{AD}+\frac{BY}{BE}+\frac{CZ}{CF} \;=\; 4\,.$$