The **Geometric-Arithmetic Mean Inequality** is on pages 29–30. Recall the terminology: for $a \geq 0$ and $b \geq 0$,

$$\text{geometric mean of } a \text{ and } b \text{ is } \quad = \sqrt{ab} \tag{GM}$$

$$\text{arithmetic mean of } a \text{ and } b \text{ is } \quad = \frac{a+b}{2}. \tag{AM}$$

The **Geometric-Arithmetic Mean Inequality** says ⟨think: GM ≤ AM⟩

$$\sqrt{ab} \leq \frac{a+b}{2} \tag{GM/AM}$$

with equality occurring if and only if $a = b$.

ER 2.1.51 An application of the Geometric-Arithmetic Mean Inequality. §2.1 BS4p29-30

Let $x \geq 0$ and $y \geq 0$ and $z \geq 0$. Using the Geometric-Arithmetic Mean inequality, prove that

$$xy + yz + xz \leq x^2 + y^2 + z^2. \tag{1}$$

Hint: Get a system of three inequalities, each from the GM-AM inequality.

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