orderings of a Grey Code arrangement are possible, i.e., the number of sign changes in the components between two adjacent vectors including the last with the first is exactly one. For example in E^3, we have the ordering

$$(1,1,1),(1,-1,1),(-1,-1,1),(-1,1,1),(-1,1,-1),$$
$$(-1,-1,-1),(1,-1,-1),(1,1,-1).$$

This ordering works since the third components are in monotonic order. One can also show that the cyclic permutations of these 8 vectors are all possible orderings. Is this also true in E^n?

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A Coordinate Approach to the AM-GM Inequality

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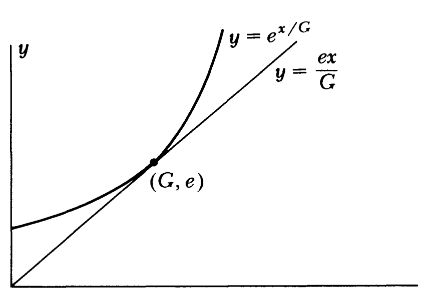
Let $a_1, a_2, \ldots, a_n$ be n positive numbers with arithmetic mean A and geometric mean G. The *AM–GM* Inequality states that $A \geqslant G$ with equality if and only if $a_1 = a_2 = \cdots = a_n$.

The graph of $y = e^{x/G}$ is concave upward and thus the tangent line $y = (ex/G)$ at (G, e) lies below the curve. To show $A \geqslant G$, we substitute $x = a_i$ $(i = 1, 2, \ldots, n)$ successively into $e^{x/G} \geqslant (ex/G)$ and multiply. Hence

$$e^{(a_1 + a_2 + \cdots + a_n)/G} \geqslant \left(\frac{ea_1}{G}\right)\left(\frac{ea_2}{G}\right) \cdots \left(\frac{ea_n}{G}\right) = e^n.$$

Thus, we have $nA/G \geqslant n$ or $A \geqslant G$, with equality if and only if $a_1 = a_2 = \cdots = a_n = G$.



Acknowledgement. This proof is a geometric variation of the proof suggested by G. L. Alexanderson to Ivan Niven in *Maxima and Minima Without Calculus*, MAA, 1981, pp. 240–241.