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by randomusername

- 1 Define for n given positive reals the *strange mean* as the sum of the squares of these numbers divided by their sum. Decide which of the following statements hold for $n = 2$:
- a) The strange mean is never smaller than the third power mean.
 - b) The strange mean is never larger than the third power mean.
 - c) The strange mean, depending on the given numbers, can be larger or smaller than the third power mean.

Which statement is valid for $n = 3$?

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- 2 For any positive integer k define $f_1(k)$ as the square of the digital sum of k in the decimal system, and $f_n(k) = f_1(f_{n-1}(k)) \forall n > 1$. Compute $f_{1992}(2^{1991})$.
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- 3 Consider finitely many points in the plane such that no three are collinear. Prove that we can paint the points with two colors such that there is no half-plane that contains exactly three points such that those three points have the same color.
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