so $G''(x) \ge 0$, since $e^{-t} \ge 1-t$ for $t \ge 0$. Thus, $G(x)$ is also superadditive which gives the right-hand half of (2).

It is to be noted that the case of the left-hand inequality, when the n_i are non-negative integers, reduces to a problem of Leo Moser (*Math. Mag.*, **31**(1957) 113). The neat solution by Chi-yi Wong was to first write $(n_1+n_2+\cdots+n_r)^n = n^n$ and then to note that each term of the multinomial expansion of the left-hand expression is less then n^n.

Editorial Note. The solution by [Otto G.]Ruehr suggests a further problem: Determine

$$\sup\left\{\alpha \ : \ \sum f_\alpha(t_i) \ge f_\alpha(t) \quad \text{whenever} \quad t = t_1+t_2+\cdots+t_r \quad t_i \ge 0 \quad r = 1,2,\ldots\right\}$$

where

$$f_\alpha(x) = \log\{\gamma(1+x)/(x+\alpha)^{x+\alpha}\}$$

Clearly from the problem, $0 \le \alpha \le 1$.

Amer. Math. Monthly, **87**(1980) 675.

6312*. *Proposed by M. S. Klamkin, University of Alberta*

Prove or disprove that the set of n equations in n unknowns

$$x_1^{l_i} + x_2^{l_i} + \cdots + x_n^{l_i} = 0 \qquad (i = 1,2,\ldots,n)$$

where the l_i arerelatively prime positive integers, has only the trivial solution $x_i = 0$ $(i = 1,2,\ldots,n)$ if and only if each $m = 2,3,\ldots,n$ divides at least one l_i.

Amer. Math. Monthly, **89**(1982) 505.

Solution by Constantine Nakassis, Gaithersburg, Maryland. Let $n > 2$ be an even number $(n = 2k)$; suppose that the only even number in l_1, l_2 $\ldots$ l_n is l_1 (for example take $l_1 = n!$ and let l_2, $\ldots$ l_n be the first $n-1$ primes that follow n). Consider any k comple numbers which satisfy

$$y_1^{l_i} + y_2^{l_i} + \cdots + y_n^{l_i} = 0$$

Let $x_{2i-1} = y_i$, $x_{2i} = -y_i$ for $i = 1,2,\ldots,k$. Itis clear then that the proposed system has nontrivial solutions. (The starred assertion is true if $n = 2$, but false if $n = 2k+1 > 3$.)

The case $n = 3$ remains open; the starred assertion has been established by the proposer for many triples.