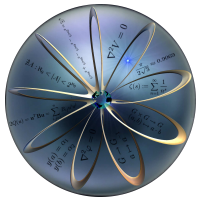

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Muirhead's theorem

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Let $0 \le s_1 \le \cdots \le s_n$ and $0 \le t_1 \le \cdots \le t_n$ be real numbers such that

$$\sum_{i=1}^{n} s_i = \sum_{i=1}^{n} t_i \text{ and } \sum_{i=1}^{k} s_i \le \sum_{i=1}^{k} t_i \ \ (k = 1, \ldots, n-1)$$

Then for any nonnegative numbers $x_1, \ldots, x_n$,

$$\sum_{\sigma} x_1^{s_{\sigma(1)}} \ldots x_n^{s_{\sigma(n)}} \ge \sum_{\sigma} x_1^{t_{\sigma(1)}} \ldots x_n^{t_{\sigma(n)}}$$

where the sums run over all permutations σ of $\{1, 2, \ldots, n\}$.