Question 23816 Show that rank$(A + B)$ is never greater than the sum of rank(A) and rank(B).
Answer. Assume that A, B are matrix from $V = R^n$ to $W = R^m$. Next, by the definition $\mathrm{rank}(A+B) = \dim((A+B)V) = \dim(AV+BV) \leq \dim(AV)+\dim(BV) = \mathrm{rank}(A) + \mathrm{rank}(B)$, since dimension of sum of vector spaces is less than sum of dimensions of the respective terms.