

Problem for the week of January 30, 2012

Let  $A$  and  $B$  be  $m \times n$  and  $p \times n$  matrices, respectively. If  $\text{rank}A + \text{rank}B < n$ , show that there exists a nonzero  $n$ -dimensional vector  $\mathbf{x}$  such that  $A\mathbf{x} = \mathbf{0}$  and  $B\mathbf{x} = \mathbf{0}$ .