

Math 518 Homework 4

due Wednesday, 02/11

Sec.8 #1 (d,f); Sec.9 #2 (c,d); #3.

and the problem:

Consider a system of m homogeneous equations in n variables.

- (a) Suppose that $m \geq n$. Can such a system have a non-trivial solution?
- (b) Suppose that $m = n$. Give a condition in terms of the row vectors r_i which is equivalent to the absence of non-trivial solutions.
- (c) We proved that any homogeneous system with $m < n$ has a non-trivial solution.

Is it true that any non-homogeneous system with $m < n$ has a solution?

Justify your answers, i.e. give examples or proofs.