Metabolic Modeling, Ex Tempore exercises, solutions

March 16, 2007

1. Type the corresponding augmented matrix **Ab** to MATLAB and say *rrefmovie(Ab)* to get a step-by-step solution.

2. *rank(A)*, *x = rref[A b]; x = x(:,end)*.

3. *A = round(10*rand(200)); b= rand(10*rand(200,1));*. Timing of operations: *t = cputime; x = rref([A b]);x= x(:,end);t =cputime -t*. Computing the norm of the residual vector: *norm(A*x-b)*. Take-home message: The execution times and also the results of different methods for solving linear equation systems can be very different.

4. The system in underdetermined, thus it have infinitely many solutions and the nullity of $\mathbf{A} > 0$.

5. The system is inconsistent. Function *pinv* can be used to obtain a solution the minimizes the norm of the residual.

6. Solution in a separate file.