

18.06 Problem Set 3

Due Wednesday, 24 September 2008 at 4 pm in 2-106.

Problem 1: Do problem 9 from section 3.1 in the book.

Problem 2: Do problem 27 from section 3.1.

Problem 3: Do problems 1 and 2 from section 3.2.

Problem 4: Do problem 18 from section 3.2.

Problem 5: Do problem 8 from section 3.3.

Problem 6: Do problem 19 in section 3.3.

Problem 7: Do problem 21 in section 3.3.

Problem 8: Do Problem 5 in section 3.4.

Problem 9: This problem asks you to observe a relationship between the rank of the matrix and the singular values of a matrix. The singular values will show up later in the course, but nothing is stopping us from computing them today and seeing what happens. The command is `svd` or `SingularValues` (the latter for Mathematica and `Maple:LinearAlgebra`). Try rectangular matrices with full row rank, full column rank, and where the rank is smaller than m and n . Possibly taking into account that on a computer tiny numbers rather than zero will show up due to roundoff issues, what relationship do you observe?

Educational Note: Large singular values are often associated with the main "information" contained in a matrix. More later.