

**Homework 2**  
**due Thurs., Feb. 5**

(1) Let  $A$  be an  $m \times n$  matrix. Prove that

$$\|A\|_\infty = \max_{1 \leq i \leq m} \sum_{j=1}^n |A_{ij}|.$$

(2) Let  $a \leq x_0 \leq b$  and consider the linear functional  $\ell : C[a, b] \rightarrow \mathbb{C}$  defined via

$$\ell(f) = f(x_0).$$

Show that  $\|\ell\| = 1$  when  $C[a, b]$  is given the max norm  $\|f\|_\infty = \max_{a \leq x \leq b} |f(x)|$ .

(3) problem 19 page 35

(4) problem 21 page 35

(5) problem 28 page 36. It appears that pages 36-37 are missing in the reader. Problem 28 asks you to find the best fit least squares parabola for the following data:

$x$	0	1	3	4
$y$	0	8	8	20