

1 Theoretical part

3.1 (due Feb 19, 2008) CLRS 28.1-3, 28.1-4, 28.1-6, 28.1-7, 28.1-10, 28.2-5, 28.2-6, 28.3-4, 28.3-5.

2 Applied part (due Feb 19, 2008)

3.2 (due Feb 19, 2008) For an $n \times n$ matrix $A = \{a_{ij}\}_{i,j=1}^n$, let

$$|A|_{pq} = \left(\sum_{j=1}^n \left(\sum_{i=1}^n |a_{ij}|^p \right)^{q/p} \right)^{1/q}$$

Determine (experimentally, or theoretically) for which $p, q \in \{1, 2, \infty\}$ is $|\cdot|_{pq}$ a matrix norm?

3.3 (due Feb 19, 2008) For an $n \times n$ matrix $A = \{a_{ij}\}_{i,j=1}^n$, let

$$\|A\|_{pq} = \max\{\|Ax\|_q; \|x\|_p \leq 1\}$$

Determine (experimentally, or theoretically) for which $p, q \in \{1, 2, \infty\}$ is $\|\cdot\|_{pq}$ a matrix norm?