Homework

Exercise 1: For $A \in M_n$ proof:

$$(a) \parallel A^2 \parallel \leq \parallel A \parallel^2, \parallel A^p \parallel \leq \parallel A \parallel^p, p = 2,3,...$$

(b) if
$$A^2 = A$$
 then $|||A|| \ge 1$

(c) if A is invertible, then
$$|||A^{-1}||| \ge \frac{|||I|||}{|||A|||}$$

$$(d) ||| I ||| \ge 1.$$

Homework

Exercise 2. Proof $n \| \cdot \|_{\infty}$ is a matrix norm, where n is the size of the matrix.

Exercise 3. The spectral norm $\|\cdot\|_2$

$$|||A|||_2 = \max \{ \sqrt{\lambda} : \lambda \text{ is an eigenvalue of } A^*A \}$$

is deduced by the l_2 norm.