Matrix norms

1. Prove that $||A||_c = n \max\limits_{1 \leqslant i,j \leqslant n} |a_{ij}|$ is a matrix norm.

2. Is the function $f(A) = \max\limits_{1 \leqslant i,j \leqslant n} |a_{ij}|$ a matrix morm?

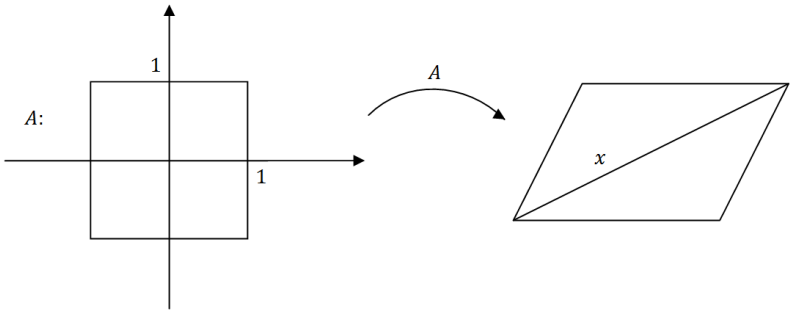
3. Prove that $||A^{-1}|| \geqslant \dfrac{||E||}{||A||}$ and $||A^{-1}|| \geqslant ||A||^{-1}$.

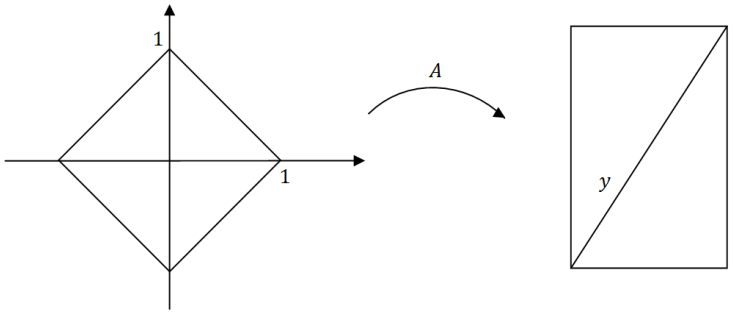
4. Find the norms $||A||_\infty,\ ||A||_1,\ ||A||_2,\ ||A||_F,\ ||A||_c$ of the matrix

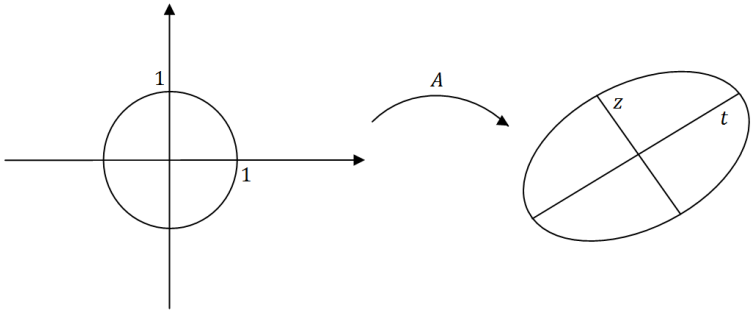
$$A = \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix}$$

(maybe using matrix calculators or other computer tools).

5. Find $x,\ y,\ z,\ t$, if $A = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$







How to evaluate matrix norms of A using these pictures?