Definition 11.36. [11G] *Let $A \in \mathbb{R}^{m\times n}$ be a matrix; considering it as a linear application between normed spaces $(\mathbb{R}^n, ||_p)$ and $(\mathbb{R}^m, ||_q)$, let's define again the* induced norm *as*

$$\|A\|_{p,q} \stackrel{def}{=} \max_{x\in\mathbb{R}^n\ ,\ |x|_p\leq 1} |Ax|_q \qquad (11.37)$$

(Note that the maximum is always reached at a point with $|x|_p = 1$).
The norm $\|A\|_{2,2}$ is called the spectral norm. .