Product Norm

Definition: Let $(E_j, \|\cdot\|_j)$, $1 \leq j \leq m$, be normed vector spaces over $\mathbb{K}$. Then

$$\|X\|_\infty := \max_{1 \leq j \leq m} \|x_j\|_j$$

where $X = (x_1, \ldots, x_m) \in E := E_1 \times \cdots \times E_m$.

This defines a norm, called the product norm, on the product vector space E.

The metric on E induced from this norm coincides with the product metric, when d_j is the metric induced on E_j from $\|\cdot\|_j$.

Recommended Reading

- **Calculus On Normed Vector Spaces** by Rodney Coleman (Match: 0.66)

- **Real Analysis** by Patrick Fitzpatrick (Match: 0.66)

- **Tutorium Analysis 2 und Lineare Algebra 2** by Florian Modler, Martin Kreh (Match: 0.66)