



**Why**

All continuous functions between norm spaces are bounded linear functions.

**Result**

**Proposition 1.** *Let  $((V_1, F), \|\cdot\|_1)$  and  $((V_2, F), \|\cdot\|_2)$  be two norm spaces. Let  $f : V_1 \rightarrow V_2$  be a linear function between two norm spaces. Then*

1.  *$\exists x \in V_1$  such that  $f$  is continuous at  $x$ ,*
2.  *$f$  is continuous,*
3.  *$f$  is uniformly continuous, and*
4.  *$f$  is bounded,*

*are all equivalent conditions.*



