Why

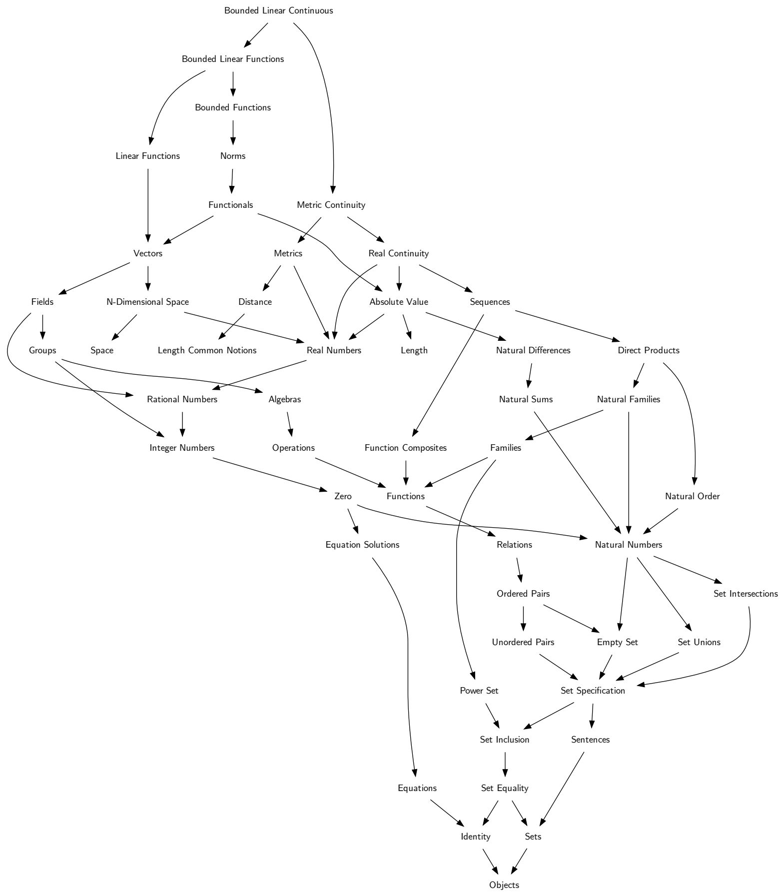
All continuous functions between norm spaces are bounded linear functions.

Result

Proposition 1. *Let $((V_1, F), |\cdot|_1)$ and Let $((V_2, F), |\cdot|_2)$ be two norm spaces. Let $f : V_1 \to V_2$ 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.


Bounded Linear Continuous
Bounded Linear Functions
Bounded Functions
Linear Functions
Norms
Functionals
Metric Continuity
Vectors
Metrics
Real Continuity
Fields
N-Dimensional Space
Distance
Absolute Value
Sequences
Groups
Space
Length Common Notions
Real Numbers
Length
Natural Differences
Direct Products
Rational Numbers
Algebras
Natural Sums
Natural Families
Integer Numbers
Operations
Function Composites
Families
Zero
Functions
Natural Order
Equation Solutions
Relations
Natural Numbers
Ordered Pairs
Set Intersections
Unordered Pairs
Empty Set
Set Unions
Power Set
Set Specification
Set Inclusion
Sentences
Equations
Set Equality
Identity
Sets
Objects