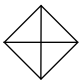


## Why

We can give the set of bounded linear functions between two norm spaces a norm.

## Definition

The *norm* of a bounded linear function is the smallest real number by which we can bound the result on a vector times the norm of that vector.

### Notation

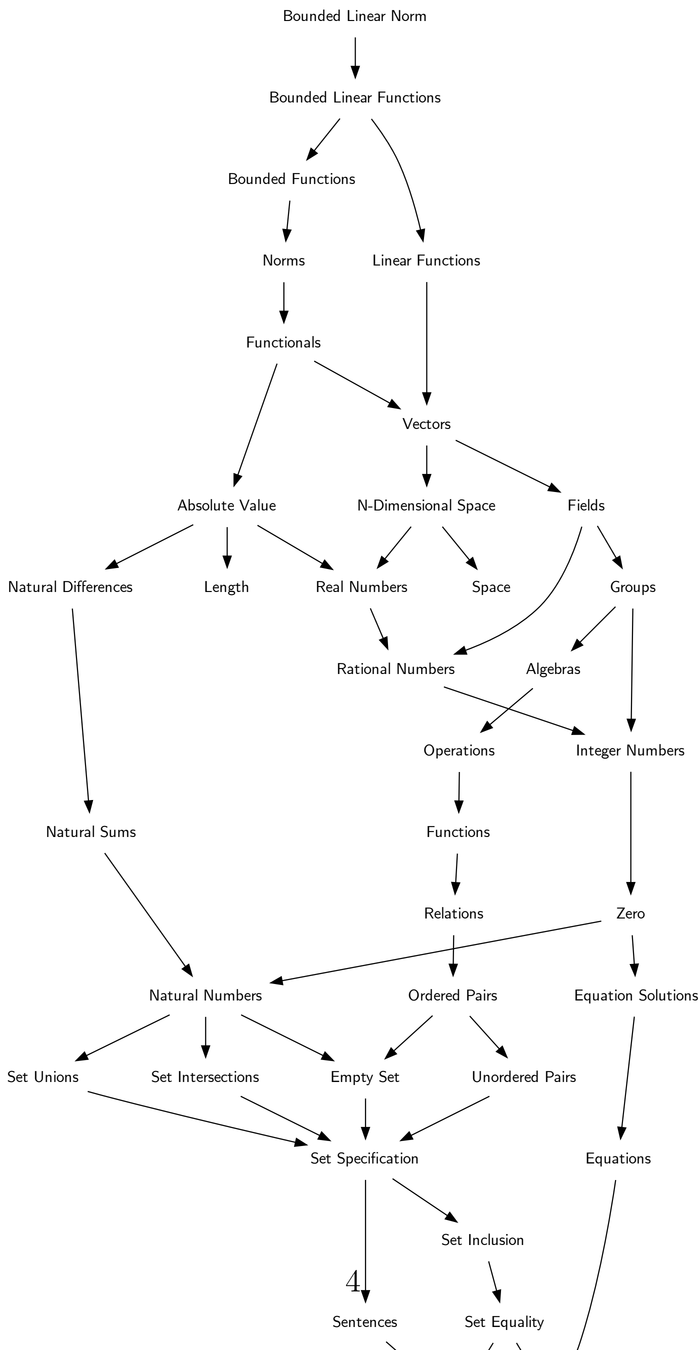
Let $((V_1, F_1), |\cdot|_1)$ and $((V_2, F_2), |\cdot|_2)$ be two norm spaces. Let $f : V_1 \to V_2$ be linear and bounded. The norm of $f$ is the smallest $C$ so that

$$|f(v)|_2 \leq C|v|_1.$$

## Equivalent Formulation

Proposition **1.** *Let $((V_1, F_1), |\cdot|_1)$ and $((V_2, F_2), |\cdot|_2)$ be two norm spaces. Let $f : V_1 \to V_2$ bounded and linear. The norm of $f$ is*

$$\sup_{|x|_1 = 1} |f(x)|_2.$$



Bounded Linear Norm
Bounded Linear Functions
Bounded Functions
Norms
Linear Functions
Functionals
Vectors
Absolute Value
N-Dimensional Space
Fields
Natural Differences
Length
Real Numbers
Space
Groups
Rational Numbers
Algebras
Operations
Integer Numbers
Natural Sums
Functions
Relations
Zero
Natural Numbers
Ordered Pairs
Equation Solutions
Set Unions
Set Intersections
Empty Set
Unordered Pairs
Set Specification
Equations
Set Inclusion
Sentences
Set Equality