$\mathbb{R}^N$

Limits in $\mathbb{R}^N$

Closed sets in $\mathbb{R}^N$

Compact Sets in $\mathbb{R}^N$

Continuous Functions in $\mathbb{R}^N$

Image of a compact set under a continuous mapping is compact:
   A continuous real-valued function on a compact set achieves its maximum

Convex Sets in $\mathbb{R}^N$

Brouwer FPT

Firms: Compact strictly convex technology
   Continuous profit maximizing behavior yields continuous supply function

Households: Continuous tastes can be represented by a continuous utility function
Continuous demand: Adequacy of income, continuous preferences

Existence of General equilibrium: Continuous excess demand function
   Walras Law

1st Fundamental Theorem of Welfare Economics