

# MATH5825 Applied Analysis

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# 1 September 7th

## 1.1 Contraction Mapping Theorem

**Example 1.1**

Let  $U$  be convex and closed in  $\mathbb{R}^n$ , Let  $f \in \mathcal{C}^1(U, \mathbb{R}^n)$  be s.t.  $\|\frac{\partial f_i}{\partial x_i}\|$

## 1.2 Solving Nonlinear Equations

We want to solve  $f(x) = 0$ , where  $f : \mathbb{R}^n \rightarrow \mathbb{R}^n$ .