UT Austin CSE 386D

Some Notes on Function Spaces

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- 1 Preliminaries
- 2 Lebesgue Spaces
- 3 Distributions
- 4 Sobolev Spaces

Theorem 4.1. Here, we use the following notation: $(M^{\alpha}f)(x) = x^{\alpha}f(x)$. If $T \in \mathcal{S}'$ and $f \in \mathcal{S}$, then T * f is smooth and polynomially bounded.

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Things to revisit:

• Prop. 6.14: If p is a polynomial, $g \in \mathcal{S}$, and α a multiindex, then the maps $f \mapsto pf$, $f \mapsto gf$, and $f \mapsto D^{\alpha}f$ are continuous maps from \mathcal{S} into itself.

• Prop 6.15: If $f_j \to f$ in \mathcal{S} , then $f_j \to f$ in L^p for $1 \le p \le \infty$.

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