

**INTRO TO DYNAMICAL SYSTEMS FALL 2024,
PROBLEM SET 8**

- (1) Show that the map $\mathcal{L}^{-1}$ from Lemma 4.3 in Lecture 8 preserves Holder continuity as follows: there is $\alpha_* > 0$ such that for all $\alpha \in (0, \alpha_*]$, we have that (here $x, y \in \mathbb{R}^n$) if

$$[g]_\alpha := \sup_{x \neq y} \frac{|g(x) - g(y)|}{|x - y|^\alpha} < \infty$$

then

$$[\mathcal{L}^{-1}g]_\alpha \leq C \cdot [g]_\alpha.$$

For this take advantage of the explicit formulae for $v_\pm$ in the proof of the lemma.

- (2) Show that the function h effecting the conjugation in Proposition 4.2 is Holder continuous (for a sufficiently small Holder exponent).