MAT 1060H1F
Assignment 6

Prof. McCann — Due: Noon on Thursday Oct. 21

We have covered Evans Ch 3.2 and will proceed with 3.3–3.4 before moving to Ch 5.

To be handed in: Evans (Second edition) # 3.5, 3.6, 3.9, 3.10, 3.12, plus

6. Show all norms on $\mathbf{R}^n$ are equivalent: i.e., given two norms $\|\cdot\|_1$ and $\|\cdot\|_2$, show there exist constants $C, c > 0$ such that all $x \in \mathbf{R}^n$ satisfy

$$\|x\|_2 \leq c\|x\|_1 \leq C\|x\|_2.$$

BONUS (for fun; not to be graded): Fixing $\|\cdot\|_2$ to be the Euclidean norm, find the smallest C for which every other norm $\|\cdot\|_1$ admits $c > 0$ such that the above inequalities hold throughout $\mathbf{R}^n$.