MATH 147 Discussion
Quiz 2
February 12, 2021

Directions: Write your solutions to each question on a separate sheet of paper. Once you are finished with the quiz, take pictures of your solutions to each question **separately**, and submit your quiz solutions on Crowdmark, separated by question (Q1, Q2, Q3). Please note that you must submit your quiz by 1:10 p.m. deadline, unless I give a time extension to everyone.

(5pts) 1. Unscramble the following anagrams of the last names of mathematicians relevant to the field of Fourier analysis.

(0.5pts) (a) LIERDITCH

(0.5pts) (b) OURFIRE

(0.5pts) (c) GREENLED

(0.5pts) (d) CAPELLA

(0.5pts) (e) LEPRECHALN

(0.5pts) (f) SWATCHRZ

(0.5pts) (g) POISONS

(0.5pts) (h) IMANNER

(0.5pts) (i) SAVPEARL

(0.5pts) (j) IDSLAPU

(10pts) 2. Consider the vector space $\mathcal{R}$, the set of complex-valued Riemann integrable functions on $[0, 2\pi]$, equipped with the inner product

$$(f, g) = \frac{1}{2\pi} \int_0^{2\pi} f(x)\overline{g(x)}\, dx$$

and its associated norm

$$\|f\| = \left(\frac{1}{2\pi} \int_0^{2\pi} |f(x)|^2\, dx \right)^{\frac{1}{2}}$$

for any $f, g \in \mathcal{R}$. Prove the Cauchy-Schwarz inequality

$$|(f, g)| \leq \|f\|\|g\|$$

and the triangle inequality

$$\|f + g\| \leq \|f\| + \|g\|.$$