# TA SESSION OF INTRODUCTION TO MATHEMATICAL ANALYSIS FOR GROUP 3

FEBRUARY 22, 2022

(1) Given a sequence of functions $\{f_n(x)\}_{n=1}^{\infty}$ which is not satisfy

$$\lim_{n\to\infty}\int_0^1 f_n(x)dx = \int_0^1 \lim_{n\to\infty} f_n(x)dx$$

(2) Find the limit of the sequence, *i.e.* $f(x) = \lim_{n\to\infty} f_n(x)$. Show that by definition.

(3) Explain why? Is $\{f_n\}$ uniformly continuous? The following theorem might be used.

**Remark:** $f_n \to f$ uniformly on $E$ if and only if $\|f_n - f\| \to 0$ as $n \to \infty$. Hence, a sequence of functions uniformly converge could be viewed as a sequence converges in function space.