

Math 317: Day 52

Workshop Day

Practice Problems

① Show that $f(x) = \begin{cases} 1 & \text{if } x=0 \\ 0 & \text{if } x \neq 0 \end{cases}$ is integrable on $[-1, 1]$.

② Show that step functions are integrable.

③ Let (f_n) be a sequence of integrable fns on $[a, b]$ & suppose $f_n \rightarrow f$ uniformly. Show f is integrable &

$$\lim_{n \rightarrow \infty} \int_a^b f_n = \int_a^b f$$

④ Let $f(x) = x \sin(1/x)$ for $x \neq 0$ & $f(0) = 0$. Show f is integrable on $[-1, 1]$.

⑤ Suppose f & g are diffble on $[a, b]$ s.t. $f'(x) + g'(x) = f'(x) + g'(x)$. Show $\exists x_0 \in [a, b]$ s.t.

$$f(x_0) = g(x_0).$$