

HW 3 PROBLEMS

From Rudin Chapter 6 solve 13,15,17,18,19. Also solve the following problems:

Problem 1. Let $f : [a, b] \rightarrow \mathbb{R}$ be such that $f \in \mathcal{R}(\alpha)$ for every $\alpha : [a, b] \rightarrow \mathbb{R}$ monotonically increasing. Prove that f is continuous on $[a, b]$.

Problem 2. Assume $f : [a, b] \rightarrow \mathbb{R}$ is continuous. Prove that there exists $c \in [a, b]$ such that

$$f(c) = \frac{1}{b-a} \int_a^b f(x) dx.$$