

Winter 2026 Math 131A
Homework Assignment 10

Problem 1. Ross 32.4, 32.6, 32.7, 32.8

Problem 2. Ross 33.3(a), 33.4, 33.8, 33.13

Problem 3. Let $f(x) = x^3$ be defined on $[0, 2]$. For the partition $P = \{0, 1, 2\}$, compute $L(f, P)$ and $U(f, P)$.

Problem 4. Let $f, g : [0, 1] \rightarrow \mathbb{R}$ be bounded functions. Suppose that $f(x) = g(x)$ for all $x \in (0, 1]$ and f is Riemann integrable. Prove that g is also Riemann integrable and $\int_0^1 g(x)dx = \int_0^1 f(x)dx$.

Problem 5. Let $f : [0, 2] \rightarrow \mathbb{R}$ be defined as

$$f(x) = \begin{cases} 1, & \text{if } 0 \leq x < 1, \\ \frac{1}{2}, & \text{if } x = 1, \\ 0, & \text{if } 1 < x \leq 2. \end{cases}$$

Prove that f is Riemann integrable by definition.