HW 3 PROBLEMS

From Rudin Chapter 6 solve 2,5,8,11,12. Also solve the following problems:

Problem 1. Consider $f : [a, b] \to \mathbb{R}$ defined by $f(x) = x^2$. Compute

$$\int_a^b f(x)dx$$

using only the definition of the integral.

Hint: it suffices to find a sequence of partitions P_n of $[a, b]$ with the property

$$\lim_{n \to \infty} U(P_n, f) - L(P_n, f) = 0.$$

Try the partition $P_n = \{a, a + \frac{b-a}{n}, a + 2\frac{b-a}{n}, .., b\}$.