Problem 1. (a) Show that the approximation obtained in Example 1, page 1004 is the lower Riemann sum for \( \int_R f \) corresponding to the given partition of \( R \).

(b) For the same partition of \( R \), choose different sample points to get the upper Riemann sum for that partition. Indicate these points on a sketch, like that of Figure 6, page 1004.

(c) What do these results tell you about how well any Riemann sum for that partition approximates \( \int_R f \)?

Problems 2–4. # 12, 13, 14 on page 1009.

Problem 5. #18, page 1009.

At the beginning of class on Wednesday, I'll ask you to hand in #1, 5, and one of 2–4 (I'll tell you which one at that time).

Extra Credit Problems#Due Wednesday##September

XC 1. In Problem #8, page 1009, what additional contour lines do you need to know in order to be able to do this problem? Knowing these, how do you proceed? You don’t need to do the computation, but you must write up your reasoning neatly and carefully, using complete sentences, appropriate diagrams, and correct mathematical arguments.

XC 2. Exercise 1.8 of the “Notes on Integration.”

XC 3. Exercise 2.6 of the “Notes on Integration.”