

## MATH 1310 Programming Project #9

You have the whole class period to work on the project with your group. You are required to use your own calculator and turn in your own paper. Be sure to answer all of the questions asked.

1. Write a program that uses a FOR loop to add up the numbers from 1 to 100 and display the result. (Hint: Keep a running total. The correct sum is 5050.)
  
  
  
  
  
  
  
  
  
  
2. Write a program called RIEMANN to compute both left-hand and right-hand Riemann sums of a function  $f(x)$  with  $N$  steps, where  $N$  is specified by the user. Here are a few tips:
  - (a) Assume that the function  $f(x)$  has been entered as  $y1$  in the calculator.
  - (b) The program will need to ask for  $A$  and  $B$ , the endpoints of the interval.
  - (c) The program will need to ask for  $N$ , the number of steps (subintervals).
  - (d) The program will have to calculate  $\Delta x$  and each  $x_i$ .
  - (e) Use the running total idea from above to add up the areas of the rectangles.
  - (f) The left-hand sum starts at  $x_0 = A$  and ends at  $x_{N-1}$ . How is the right-hand sum different?
  - (g) Your output should be LEFT = \_\_\_\_ RIGHT = \_\_\_\_.

3. Estimate the value of  $\int_1^4 3x^2 dx$  for  $N = 10, 100,$  and  $250$ . How big would  $N$  need to be to approximate the definite integral to within .1 of the actual value? What happens when you try to compute this on your calculator?