Here is a program that computes the left-hand sum, the right-hand sum, the midpoint sum, the trapezoid sum, and the Simpson sum approximations to the definite integral $\int_a^b f(x)\,dx$. The program displays the results together so that comparisons can be easily made. In the program, A and B are the limits of the integral, N is the number of subdivisions, and D plays the role of Δx. We store the left-hand sum in the variable L, the right-hand sum in R, the trapezoid sum in T, the midpoint sum in M, and the Simpson sum in S.

First you need to create a new program by pressing [PRGM] $\to$ [NEW]. Give it a simple name such as ISUMS. Then carefully type in the following code, pressing [ENTER] at the end of each line. To type the variables $A, B, N, D, I, L, R, M, T, S$ use the green [ALPHA] keys. To type Y_1 press [VARS] $\to$ [Y-VARS] $\to$ [1:Functions] $\to$ [Y_1]. The commands Prompt and Disp can be found by pressing [PRGM] $\to$ [I/O]. The commands For and End are in [PRGM] $\to$ [CTL]. The symbol $\longrightarrow$ can be called by pressing the key [STO$\to$].

Prompt N
Prompt A
Prompt B
$(B - A)/N \longrightarrow D$
$0 \longrightarrow R$
$0 \longrightarrow M$
For $(I, 1, N)$
$A + I * D \longrightarrow X$
$R + Y_1 * D \longrightarrow R$
$X - D/2 \longrightarrow X$
$M + Y_1 * D \longrightarrow M$
End
$R + D * Y_1(A) - D * Y_1(B) \longrightarrow L$
$(L + R)/2 \longrightarrow T$
$(2M + T)/3 \longrightarrow S$
Disp "L, R, T, M, S"
Disp L, R, T, M, S

To execute the program, first store your function $f(x)$ in the Y_1 function variable, as you normally do when you want to graph $f(x)$. Then press [PRGM] and select ISUMS. At the prompts, enter the values for $N, A,$ and B. The five approximating sums will be displayed on the home screen.