TI–83 Program: SIMPSON'S RULE & TRAPEZOIDAL RULE (press ENTER at end of line)

KEY IN	DISPLAY	EXPLANATION
PRGM > > ENTER SIMPSON	Prgm 1: SIMPSON	Program named "SIMPSON"
VARS > 4 2	FnOff	Deselects all functions
Disp 2nd α "LOWER αϕ LIMIT"	Disp "LOWER LIMIT"	Lower limit of integration
Input α A	Input A	After ?, type in the lower limit of integration
Disp 2nd α "UPPER αϕ LIMIT"	Disp "UPPER LIMIT"	Upper limit of integration
Input α B	Input B	After ?, type in the upper limit of integration
Disp 2nd α "N αϕ SUBINTERVALS"	Disp "N SUBINTERVALS"	Number of subintervals for [A, B] is N
Disp 2nd α "ENTER αϕ EVEN αϕ N"	Disp "ENTER EVEN N"	The number N is to be entered
Input α N	Input N	After ?, type in N
ϕ STO α S	ϕ → S	0 is stored in location S (for Simpson's Rule)
ϕ STO α V	ϕ → V	0 is stored in location V (for the Trapezoidal Rule)
(α B - α A) / αN STO α W	(B – A)/N → W	Subinterval width (B–A)/N stored in location W
1 STO α J	1 → J	1 is stored in location J
Lbl 1	Lbl 1	Start of loop
α A + 2(α J – 1) α W STO α L	A + 2(J – 1)W → L	Left endpoint of [A+2(j–1)W, A+2jW] stored in L
α A + 2α J α W STO α R	A + 2JW → R	Right endpoint of [A+2(j–1)W, A+2jW] stored in R
(α L + α R) / 2 STO α M	(L + R)/2 → M	Midpoint of [A+2(j–1)W, A + 2jW] stored in M
α L STO X, T, θ, n	L → X	L is stored in location X
VARS > 1 1 STO α L	Y_1 → L	Y_1 (L) is stored in location L
α M STO X, T, θ, n	M → X	M is stored in location X
VARS > 1 1 STO α M	Y_1 → M	Y_1(M) is stored in location M
α R STO X, T, θ, n	R → X	R is stored in location X
VARS > 1 1 STO α R	Y_1 → R	Y_1(R) is stored in location R
αW(αL + 4αM + αR)/3 + αS STO αS	W(L + 4M + R)/3 + S → S	New sum is stored in location S (for Simp. Rule)
αW(αL + 2αM + αR)/2 + αV STO αV	W(L + 2M + R)/2 + V → V	New sum is stored in location V (for Trap. Rule)
IS > αJ, αN/2)	IS > (J, N/2)	Increment J one step. If J > N/2, skip next command
Goto 1	Goto 1	Program returns to Lbl 1 and loops again
Disp 2nd α "Simpson Rule"	Disp "Simpson Rule"	Prepares for the Simpson's Rule approximation
Disp αS	Disp S	Displays the Simpson's Rule approximation S
Disp 2nd α "Trap Rule"	Disp "Trap Rule"	Prepares for the Trapezoidal Rule approximation
Disp αV	Disp V	Displays the Trapezoidal Rule approximation V

To execute the program approximating $\int_a^b f(x)\,dx$, do the following: 2nd QUIT (to quit the program)
Y= key in your function f(x) ENTER 2^{nd} QUIT PRGM (choose the program) ENTER

The display reads LOWERLIMIT, ?	Key in A ENTER	(gives the lower limit of integration)
The display reads UPPERLIMIT, ?	Key in B ENTER	(gives the upper limit of integration)
The display reads ENTER N, ?	Key in N ENTER	(number of subintervals of [A, B])

The display then exhibits the Simpson Rule and Trapezoidal Rule approximations for the value of the integral. Note that with this program, the number of subintervals for each rule is even.

To execute the program again, just key in ENTER

Identification of italicized words in the program: Input (PRGM > 1) Display (PRGM > 3)
Label (PRGM 9) Goto (PRGM ϕ) IS > ((PRGM αA)

Note: ϕ represents zero (distinguished from the letter O). αϕ represents a space between two words.
Also note that / represents the divide symbol on the calculator.