MIDPOINT

Variable Key:

Y_1 - The function to be evaluated
A - Lower bound
B - Upper bound
N – Number of subintervals
T – The x value for the left bound of the current interval
R – The approximate area under the curve
D – The width of each interval
C – The midpoint of the current interval
H – The value of the function at the current midpoint
I - Current number of Iterations

Program:	Comments: (not in actual program)

Input "INTEGRAND:",Y_1
Input "LOWER LIMIT:",A
Input "UPPER LIMIT:",B
Input "SUB-INTERVAL:",N
prgmEQUATION
A→T
0→R
(B-A)/N→D
For(I,1,N,1)
T+.5*D→C
Y_1(C) →H
R+H*D→R
A+I*D→T
End

Disp "AREA IS:",R

Stop

Trapezoidal

Variable Key:

Y_1 - The function to be evaluated

A - Lower bound

B - Upper bound

N – Number of subintervals

T – The x value for the left bound of the current interval

R – The approximate area under the curve

D – The width of each interval

I - Current number of Iterations

Program: **Comments: (not in actual program)**

Input "INTEGRAND:",Y_1

Input "LOWER LIMIT:",A

Input "UPPER LIMIT:",B

Input "SUB-INTERVAL:",N

prgmEQUATION

A→T

0→R

(B-A)/N→D

For(I,1,N-1,1)

A+I*D→T

R+Y_1(T) →R

End

2*R→R

R+Y1(A)+Y1(B) →R

R*0.5*D→R

Disp "INTERVALS:",N

Disp "AREA IS:",R

Stop

Simpson's 1/3 Rule

Variable Key:

Y_1 - The function to be evaluated
A - Lower bound
B - Upper bound
N – Number of subintervals
T – The x value for the left bound of the current interval
R – The total approximate area under the curve
O – Summation of the area for the odd intervals
E – Summations of the area of the even intervals
D – The width of each interval
I - Current number of iterations for the odd intervals
J – Current number of iterations for the even intervals

Program:	Comments: (not in actual program)
Input "INTEGRAND:",Y_1	//Input the equation
Input "LOWER LIMIT:",A	//Input Lower limit
Input "UPPER LIMIT:",B	//Input upper limit
Input "SUB-INTERVAL:",N	//Input the number of sub-intervals
prgmEQUATION	//Call the Equation sub-program, sets Y_1 to the equation specified in the Equation sub-program
A→T	//Set the T to the lower limit
0→R	//Set the odd interval summation variable to zero
0→O	//Set the even interval summation variable to zero
0→E	//Set the total approximation variable to zero
(B-A)/N→D	//Calculate the width of the intervals and assign to delta
For(I,1,N-1,2)	
A+I*D→T	
O+Y1(T) →O	
End	
For(J,2,N-2,2)	
A+J*D→T	
E+Y1(T) →E	
End	
4*O→O	
2*E→E	
O+E+Y1(A)+Y1(B) →R	
R*(1/3)*D→R	
Disp "INTERVALS:",N	
Disp "AREA IS:",R	

Stop