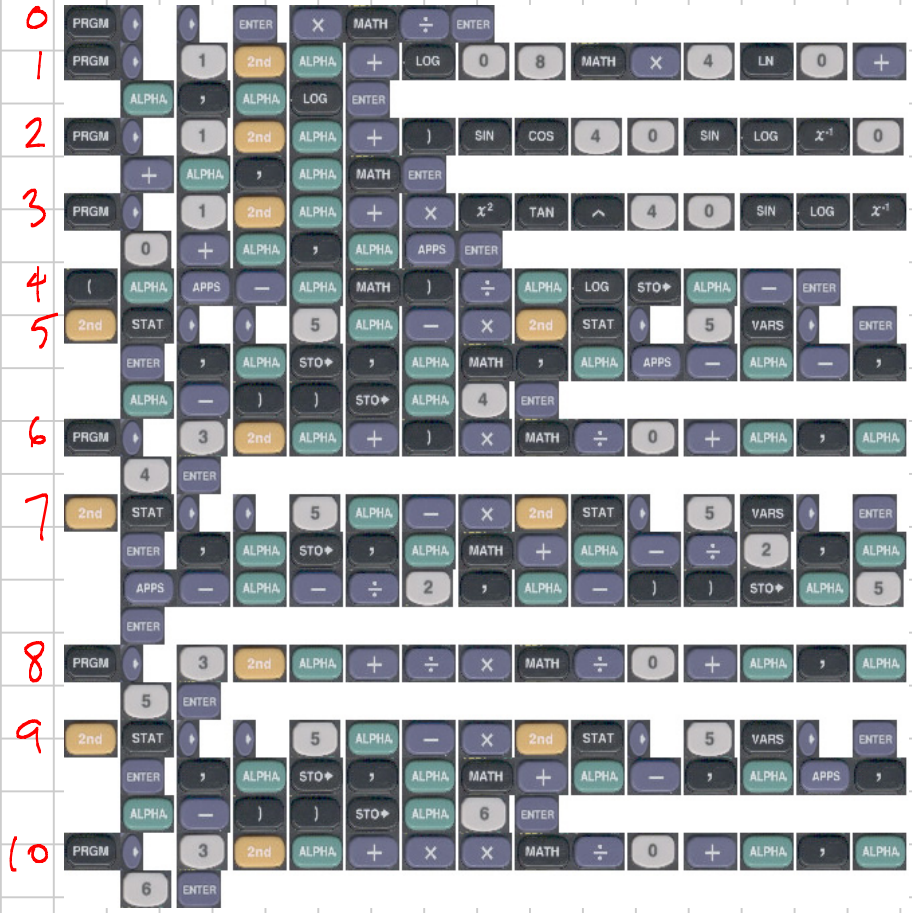
Programming the TI-83/84 Plus RAM/RAML

Note Title 2014-08-08

In Calculus, we learn that partitioning the area under a curve, gets an approximation for the area under the curve. As we use more partitions, we get closer to the exact area. The graphing calculators find answers very close to exact, so we need to program something less exact.

This program performs LRAM, MRAM, and RRAM for a specified number of partitions. You need to define the function in Y_1.

```
0 PROGRAM:RAM
1 :Input "N PARTS
  ",N
2 :Input "LEFT END
  ",A
3 :Input "RIGHT EN
  D ",B
4 :(B-A)/N→W
5 :sum(W*seq(Y1,X,
  A,B-W,W))→T
6 :Disp "LRAM ",T
7 :sum(W*seq(Y1,X,
  A+W/2,B-W/2,W))→
  U
8 :Disp "MRAM ",U
9 :sum(W*seq(Y1,X,
  A+W,B,W))→V
10 :Disp "RRAM ",V
```



```
Plot1 Plot2 Plot3
\Y1■.25X^2+2
\Y2=
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
```

```
N_PARTS 1
LEFT_END 0
RIGHT_END 4
LRAM
                  8
MRAM
                 12
RRAM
                 24
               Done
```

```
Plot1 Plot2 Plot3
\Y1■X^2
\Y2=
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
```

```
prgmRAM
N_PARTS 4
LEFT_END 0
RIGHT_END 4■
LRAM
                 14
MRAM
                 21
RRAM
                 30
               Done
■
```

In real-life applications, we don't always have an explicit function. Sometimes, we just get a table of data. So, we can use RAML - RAM List.

To use this program, enter your list into L_1. For this function, we don't use N; we use W - the partition width.

```
PROGRAM:RAML
:Input "W ",W
:dim(L1)→N
:sum(L1)→S
:Disp "LRAM ",(S
-L1(N))*W
:Disp "MRAM ",(2
*S-L1(1)-L1(N))*
W/2
:Disp "RRAM ",(S
-L1(1))*W
:
```

Length of a Road You and a companion are driving along a twisty stretch of dirt road in a car whose speedometer works but whose odometer (mileage counter) is broken. To find out how long this particular stretch of road is, you record the car's velocity at 10-sec intervals, with the results shown in the table below. (The velocity was converted from mi/h to ft/sec using 30 mi/h = 44 ft/sec.) Estimate the length of the road by averaging the LRAM and RRAM sums.

Time (sec)	Velocity (ft/sec)	Time (sec)	Velocity (ft/sec)
0	0	70	15
10	44	80	22
20	15	90	35
30	35	100	44
40	30	110	30
50	44	120	35
60	35