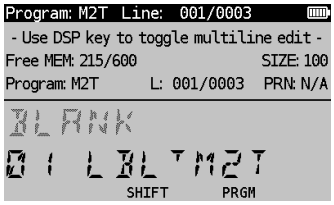
M2T

Display



(HP-41CX, Hewlett Packard 1983 and DM41X, SwissMicros 2020)

Overview[1]

The M2T program can multiply two n^order polynomials, e.g.:

$$(a_3\mathbf{x}^3 + a_2\mathbf{x}^2 + a_1\mathbf{x} + a_0)(b_2\mathbf{x}^2 + b_1\mathbf{x} + b_0) = c_5\mathbf{x}^5 + c_4\mathbf{x}^4 + c_3\mathbf{x}^3 + c_2\mathbf{x}^2 + c_1\mathbf{x} + c_0$$

The program is limited to a maximum order of 9 for each of the polynomials (10 coefficients each). (The mathematical calculations center of Ben Langton, QuickMath, may be of help to solve any entered expression.)

Example

Please note that my default FIX 5 setting which can be replaced by your preferred number of decimals.

KEYSTROKES	DISPLAY	COMMENTS
		Multiply $(2\mathbf{x}^2 - 11\mathbf{x} + 12)(12\mathbf{x}^2 + 3\mathbf{x} - 42)$
[XEQ] [ALPHA] M2T [ALPHA]	DEG.1:?	Degree of first polynomial
2 [R/S]	a2:?	Enter a_2=2
2 [R/S]	a1:?	Enter a_1=-11
-11 [R/S]	a0:?	Enter a_0=12
12 [R/S]	DEG.2:?	Degree of second polynomial
2 [R/S]	b2:?	Enter b_2=12
12 [R/S]	b1:?	Enter b_1=3
3 [R/S]	b0:?	Enter b_0=-42 (see also example in M1T)
-42 [R/S]	c4:24,00000	Coefficients c_4 - c_0
[R/S]	c3:-126,00000	
[R/S]	c2:27,00000	
[R/S]	c1:498,00000	
[R/S]	c0:504,00000	$f(x) = 24\mathbf{x}^4 - 126\mathbf{x}^3 + 27\mathbf{x}^2 + 498\mathbf{x} - 504$
[R/S]		Run again for another multiplication

[1] *This program is copyright and is supplied without representation or warranty of any kind. The author assumes no responsibility and shall have no liability, consequential or otherwise, of any kind arising from the use of this program material or any part thereof*

Program Listing

The listing of BOOL is given below with 2 function which need to be added with their name. Four more examples have been added in the listing below.

```
01▪LBL "M2T"
02 FIX 00
03 CF 29
04 CLRG
05 "DEG.1=?"
06 1
07 PROMPT
08 STO 40
09 +
10 X<>Y
11▪LBL 01
12 "a"
13 ARCL L
14 >"=?"
15 PROMPT
16 STO IND Z
17 LASTX
18 1
19 ST- L
20 X<=Y?
21 GTO 01
22 "DEG.2=?"
23 PROMPT
24 STO 41
25▪LBL 03
26 11
27 X<>Y
28 +
29 "b"
30 ARCL L
31 >"=?"
32 PROMPT
33 STO IND Y
34 LASTX
35 -1
36 ST+ Y
37 X<>Y
38 X>Y?
39 GTO 03
40 RCL 40
41 1 E3
42 /
43 STO 42
44▪LBL 05
45 RCL 41
46 1 E3
47 /
48 STO 43
49▪LBL 06
50 RCL 42
51 1
52 +
53 STO 44
54 RCL 43
55 11
56 +
57 STO 45
58 RCL 42
59 RCL 43
60 +
61 21
62 +
63 STO 46
64 RCL IND 44
65 RCL IND 45
66 *
67 ST+ IND 46
68 ISG 43
69 GTO 06
70 ISG 42
71 GTO 05
72 RCL 40
73 RCL 41
74 +
75 21.02
76 +
77 STO 00
78▪LBL 07
79 "c"
80 RCL 00
81 21
82 -
83 INT
84 FIX 00
85 ARCL X
86 >"="
87 FIX 05
88 ARCL IND 00
89 PROMPT
90 DSE 00
91 GTO 07
92 SF 29
93 END
(178 bytes)
```

Registers, Labels and Flags

REGISTERS	COMMENTS
R00-R10	Values a_0-a_9 1st polynomial
R11-R20	Values b_0-b_9 2nd polynomial
R21-R39	Values c_0-c_{18} new polynomial
R40	Degree of 1st polynomial
R41	Degree of 2nd polynomial
R42-R46	Work registers for pointers

LABELS	COMMENTS
LBL00	-
LBL01	Entry of values for a_i
LBL02	-
LBL03	Entry of values for b_i
LBL04	-
LBL05	Loop 1st polynomial
LBL06	Loop 2nd polynomial
LBL07	Show values for c_i

FLAGS	COMMENTS
29	Reset for alpha display and set back to default value

Downloads

The RAW/TXT format of the program is available via the website: M2T (in zip file).

