

Programming the Casio fx-9750/9860 FACPROP

Note Title

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Factoring polynomials can be tricky and time consuming. You can graph the function and search for zeros. Or you can use this program that uses the factor property for its algorithm.

Recall: $a_n x^n + a_{n-1} x^{n-1} + \dots + a_1 x + a_0$

Zeros of the function must be factors of a_0 divided by the factors of a_n . **Warning:** This program does not determine repeated roots and may show zeros more than once. You can use the roots to reduce the polynomial so that you can use other tools such as the quadratic formula to find the irrational roots.

```

=====FACPROP =====
Abs Y1(0)÷C#
If C=0#
Then "FACTOR OUT VAR"
#
Return#
IfEnd#
C÷N#
Prog "FACTSUB"#
List 1÷List 2#
"A"÷A#
Abs A÷N#
Prog "FACTSUB"#
List 1÷List 3#
ClrList 1#
0÷H#
For 1÷I To Dim List 2
#
For Dim List 3÷J To 1
Step -1#
List 2[I]÷List 3[J]÷K
#
If Y1(K)=0#
Then H+1÷H#
K÷List 1[H]#
IfEnd#
If Y1(-K)=0#
Then H+1÷H#
-K÷List 1[H]#
IfEnd#
Next#
Next#
"RATIONAL ZEROS"#
List 1#
TOP BTM SRC MENU A↔3 CHAR
    
```

This program is far too large for me to provide the keystrokes. But I may provide a video later.

Here is an example. I've entered the polynomial in factored form so that you can tell it's working.

```

Graph Func :Y=
Y1=(X-2)(X+4)(2X-3)(X^2-6)
Y2: [ ]
Y3: [ ]
Y4: [ ]
Y5: [ ]
Y6: [ ]
SEL DEL TYPE STYL F1 F2 DRAW
    
```

A2
2
RATIONAL ZEROS

Done

ANS
1
2
3
4
5
1.5
-4
-4

Extra Zeros

List of a_0 factors

Zeros List

List of a_n factors.

	List 1	List 2	List 3	List 4
SUB				
1	1	1	1	
2	1	2	2	
3	1.5	3		
4	-4	4		
5	-4	6		
6		8		
7		9		
8		12		
				12

GRAPH CALC TEST DATA DIST

We see that $1 \div 1 = 1$
 $2 \div 2 = 1$
 \neq
 $-4 \div 1 = -4$
 $-8 \div 2 = -4$
 gives us the extra zeros.

Recall that we must test \pm factors.

This program requires you to factor out the variable so that there is a constant term!

eg) $x^5 - 3x^4 + 6x^2 = x^2(x^3 - 3x^2 + 6)$

↓ Enter this as your function.
 you have $x=0$ as a double root.