

File # 3.05.01

OPERATION

$x^n + a_1 x^{n-1} + a_2 x^{n-2} + \dots + a_{n-1} x + a_n = 0$
 find r_i $i = 1, 2, 3 \dots n$
 such that
 $f(r_i) = 0$

POLYNOMIAL Root Solver

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PRS

USE

a) CALLING LINKAGE

L	:	[	001	1	L+2	C12	35f	] or 003*
L+1	:		000	5	000	000	001	
L+2	:		<u>1E</u>	<u>0</u>	<u>nm</u>	<u>tail</u>	<u>B</u>	

b) Adaptation LINK word

L+2 : 0 00d 5 tail 094 B

c) STORAGE

j = 165 WORDSK = 148 WORDS17 CONSTANTS15 OPSTOS 350 to 35e

REQUIREMENTS AND PERFORMANCE

- a) METHOD OF OPERATION: BAIRSTOW iteration used to EXTRACT QUADRATIC FACTORS, $x^2 + Px + Q = 0$.
- b) RANGE AND form of variable: Polynomial coefficients must be REAL AND stored sequentially starting with a_1 . The degree n of $f(x)$ ~~is limited only by storage~~ ^{must be normalized} but must be ~~specified~~ ^{specified} hexadecimally in the L+2 LINK word.
- c) Accuracy is specified by ϵ which is merely the ^{two digit negative} exponent of the desired degree of precision in hexadecimal i.e.
 $\epsilon = \underline{120}_{16} = 2^{-32}$ or 32 correct bits.
- d) Performance time is dependent upon the degree of $f(x)$ AND the location of its roots. A 4th order takes approximately 45 secs. while an 8th requires close to 8 minutes.
- * If it is desired to START with values other than zero for P AND Q store them in $[35f]_{16}$ AND $[35c]_{16}$ AND LINK to 003.