COMPLEX DIVISION

PURPOSE
Carry out a complex division (element-by-element) of 2 complex variables.

DESCRIPTION
DATAPLOT stores all variables as reals. Complex variables are supported as a pair of real variables. That is, the pair Y1,Y2 of real variables can be thought of as the single complex variable Y1 + i*Y2 where i is the square root of -1.

Complex division is defined by the following equation:

$$\frac{a + bi}{c + di} = \frac{ac + bd}{c^2 + d^2} + \frac{bc - ad}{c^2 + d^2}i$$ **(EQ 3-26)**

SYNTAX
LET <v5> <v6> = COMPLEX ADDITION <v1> <v2> <v3> <v4>   <SUBSET/EXCEPT/FOR qualification>
where <v1> and <v2> are the real and imaginary components of the first input variable;
    <v3> and <v4> are the real and imaginary components of the second input variable;
    <v5> and <v6> are the real and imaginary components of the output variable;
and where the <SUBSET/EXCEPT/FOR qualification> is optional and rarely used in this context.

EXAMPLES
LET Y5 Y6 = COMPLEX DIVISION Y1 Y2 Y3 Y4
LET Y3R Y3I = COMPLEX DIVISION Y1R Y1I Y2R Y2I
LET E F = COMPLEX DIVISION A B C D SUBSET A > 10
LET E F = COMPLEX DIVISION A B C D FOR I = 1 1 20

DEFAULT
None

SYNONYMS
None

RELATED COMMANDS
COMPLEX ADDITION	=	Carries out complex addition.
COMPLEX SUBTRACTION	=	Carries out complex subtraction.
COMPLEX MULTIPLICATION	=	Carries out complex multiplication.
COMPLEX EXPONENTIATION	=	Carries out complex exponentiation.
COMPLEX SQUARE ROOT	=	Computes the complex square root.
COMPLEX CONJUGATE	=	Computes the complex conjugate.
COMPLEX ROOTS	=	Computes the complex roots.
COMPLEX CONJUGATE	=	Computes the complex conjugate.
POLYNOMIAL DIVISION	=	Carries out polynomial division.

APPLICATIONS
Mathematics, Time Series Deconvolution

IMPLEMENTATION DATE
87/10

PROGRAM
READ X1 Y1 X2 Y2
1 2 3 4
3 5 2 1
2 2 4 3
END OF DATA
LET X3 Y3 = COMPLEX DIVISION X1 Y1 X2 Y2
WRITE X1 Y1 X2 Y2 X3 Y3