

! Test version 1.4 of FM_parallel.f95, the thread-safe version of the FM package, using OpenMP.

```
PROGRAM TEST
USE OMP_LIB
USE FMVALS_PARALLEL
USE FMZM_PARALLEL
IMPLICIT NONE

INTERFACE
FUNCTION Z_TEST_FUNCTION(XI,NI,QX)      RESULT (RETURN_VALUE)
USE FMVALS_PARALLEL
IMPLICIT NONE
TYPE (MULTI) :: XI(2)
INTEGER :: NI
TYPE (MULTI), DIMENSION(2) :: RETURN_VALUE
TYPE(FM_SETTINGS) :: QX
END FUNCTION Z_TEST_FUNCTION
END INTERFACE

INTEGER, PARAMETER :: N_VALS = 10, MAX_CASE = 500
TYPE (FM) :: X1, X2, R, X_VALS(2*N_VALS), A(5,5), B(5), X(5), DET, AINV(5,5), &
            AX, BX, TOL, XVAL, FVAL, S(3), S1(3)
TYPE (IM) :: I1
TYPE (ZM) :: Z1, Z2, Z3, ZA(5,5), ZB(5), ZX(5), ZDET, ZAINV(5,5), LIST_OF_ROOTS(8)
INTEGER :: I, J, K, N_CASE, N_FOUND, N_ORDER, N_FUNCTION
INTEGER :: L, N_ERRORS, SKIP, SKIP_CHECK(30), THREADS_USED, TOTAL_CASES
CHARACTER(8) :: FILE_NUMBER
CHARACTER(25) :: FILE_NAME
CHARACTER(251) :: LINE1, LINE2
LOGICAL :: CHK_FILE_EXISTS
DOUBLE PRECISION :: TIME1, TIME2, RM, RAN(4*N_VALS*MAX_CASE)
TYPE(FM), EXTERNAL :: FM_FPRIME
TYPE(ZM), EXTERNAL :: ZM_FPRIME
TYPE(MULTI), EXTERNAL :: F_TEST_FUNCTION
EXTERNAL :: FM_RK14_F

CALL CLOCK_TIME(TIME1)

!$OMP PARALLEL PRIVATE(I,J,K,N_CASE,N_FOUND,N_ORDER,N_FUNCTION,X1,X2,R,A,B,X,DET,AINV,AX,BX, &
!$OMP &                TOL,XVAL,FVAL,S,S1,I1,Z1,Z2,Z3,ZA,ZB,ZX,ZDET,ZAINV,LIST_OF_ROOTS, &
!$OMP &                FILE_NUMBER,FILE_NAME) &
!$OMP &                SHARED(TOTAL_CASES,RAN,THREADS_USED,X_VALS)
THREADS_USED = OMP_GET_NUM_THREADS()

!           Test each operation at 2*N_VALS different arguments.

IF (OMP_GET_THREAD_NUM() == 0) THEN
X1 = TO_FM('0.001234')
X2 = TO_FM('987.6')
R = (X2/X1) ** (TO_FM(1)/(N_VALS-1))
CALL FM_FORM('E560.50',R,LINE1)
R = TO_FM(TRIM(LINE1))
X_VALS(1) = X1
DO J = 2, N_VALS
X_VALS(J) = R * X_VALS(J-1)
CALL FM_FORM('E560.50',X_VALS(J),LINE1)
X_VALS(J) = TO_FM(TRIM(LINE1))

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ENDDO
DO J = 1, N_VALS
    X_VALS(J+N_VALS) = -X_VALS(J)
ENDDO

RM = 2.0D0**31 - 1
RAN(1) = RM / 3
DO J = 2, 4*N_VALS*MAX_CASE
    RAN(J) = MOD( 314159.0D0 * RAN(J-1) , RM )
ENDDO
RAN = RAN/RM
RAN = RAN*(2*N_VALS) + 1

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ENDIF
```

```
!$OMP BARRIER
```

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DO I = OMP_GET_THREAD_NUM()+1, 2*N_VALS, OMP_GET_NUM_THREADS()

IF (I == OMP_GET_THREAD_NUM()+1) THEN
    WRITE(FILE_NUMBER, "(I8)") I
    FILE_NAME = TRIM( 'TestFM_parallel' // ADJUSTL(FILE_NUMBER) ) // '.out'
    OPEN(31+OMP_GET_THREAD_NUM(), FILE=TRIM(FILE_NAME))
ENDIF

N_CASE = 1
CALL ARGS(I, N_CASE, MAX_CASE, N_VALS, X_VALS, RAN, -1001.0, 1001.0, J, K)
X1 = X_VALS(J) + X_VALS(K)
CALL OUTPUT(I, N_CASE, X1)

N_CASE = 2
CALL ARGS(I, N_CASE, MAX_CASE, N_VALS, X_VALS, RAN, -1001.0, 1001.0, J, K)
X1 = X_VALS(J) - X_VALS(K)
CALL OUTPUT(I, N_CASE, X1)

N_CASE = 3
CALL ARGS(I, N_CASE, MAX_CASE, N_VALS, X_VALS, RAN, -1001.0, 1001.0, J, K)
X1 = X_VALS(J) * X_VALS(K)
CALL OUTPUT(I, N_CASE, X1)

N_CASE = 4
CALL ARGS(I, N_CASE, MAX_CASE, N_VALS, X_VALS, RAN, -1001.0, 1001.0, J, K)
X1 = X_VALS(J) / X_VALS(K)
CALL OUTPUT(I, N_CASE, X1)

N_CASE = 5
CALL ARGS(I, N_CASE, MAX_CASE, N_VALS, X_VALS, RAN, 0.0, 1001.0, J, K)
X1 = X_VALS(J) ** X_VALS(K)
CALL OUTPUT(I, N_CASE, X1)

N_CASE = 6
CALL ARGS(I, N_CASE, MAX_CASE, N_VALS, X_VALS, RAN, 0.0, 1001.0, J, K)
X1 = SQRT(X_VALS(J))
CALL OUTPUT(I, N_CASE, X1)

N_CASE = 7
CALL ARGS(I, N_CASE, MAX_CASE, N_VALS, X_VALS, RAN, -1001.0, 1001.0, J, K)

```

```
X1 = (X_VALS(I)) ** 2  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 8  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)  
X1 = SIN(X_VALS(I))  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 9  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)  
X1 = COS(X_VALS(I))  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 10  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)  
X1 = TAN(X_VALS(I))  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 11  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1.0,1.0,J,K)  
X1 = ASIN(X_VALS(J))  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 12  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1.0,1.0,J,K)  
X1 = ACOS(X_VALS(J))  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 13  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)  
X1 = ATAN(X_VALS(I))  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 14  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)  
X1 = SINH(X_VALS(I))  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 15  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)  
X1 = COSH(X_VALS(I))  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 16  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)  
X1 = TANH(X_VALS(I))  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 17  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)  
X1 = ASINH(X_VALS(I))  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 18  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,1.0,1001.0,J,K)  
X1 = ACOSH(X_VALS(J))  
CALL OUTPUT(I,N_CASE,X1)
```

```

N_CASE = 19
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1.0,1.0,J,K)
X1 = ATANH(X_VALS(J))
CALL OUTPUT(I,N_CASE,X1)

N_CASE = 20
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = EXP(X_VALS(I))
CALL OUTPUT(I,N_CASE,X1)

N_CASE = 21
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,0.0,1001.0,J,K)
X1 = LOG(X_VALS(J))
CALL OUTPUT(I,N_CASE,X1)

N_CASE = 22
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = EXP(X_VALS(I)) + TO_FM(2)
CALL OUTPUT(I,N_CASE,X1)

N_CASE = 23
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = EXP( X_VALS(I)) + TO_FM('2.1' )
CALL OUTPUT(I,N_CASE,X1)

N_CASE = 24
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = EXP( X_VALS(I)) + TO_FM('2.2D0' )
CALL OUTPUT(I,N_CASE,X1)

N_CASE = 25
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = EXP( X_VALS(I)) + TO_FM('2.3' )
CALL OUTPUT(I,N_CASE,X1)

N_CASE = 26
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = EXP( X_VALS(I)) + TO_FM(TO_ZM('2.4+2.5i')) )
CALL OUTPUT(I,N_CASE,X1)

N_CASE = 27
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = EXP( X_VALS(I)) + TO_FM(TO_ZM('2.5D0+2.6D0i')) )
CALL OUTPUT(I,N_CASE,X1)

N_CASE = 28
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = EXP( X_VALS(I)) + TO_FM((X_VALS(I))/10) )
CALL OUTPUT(I,N_CASE,X1)

N_CASE = 29
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = EXP( X_VALS(I)) + TO_FM(TO_IM(2)) )
CALL OUTPUT(I,N_CASE,X1)

N_CASE = 30
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = EXP( X_VALS(I)) + TO_FM(TO_ZM('2.01+2.01i')) )

```

```
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 31
```

```
CALL ARG$(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
X1 = EXP(X_VALS(I)) + TO_IM(2)
```

```
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 32
```

```
CALL ARG$(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
X1 = EXP( X_VALS(I)) + TO_IM(2.1) )
```

```
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 33
```

```
CALL ARG$(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
X1 = EXP( X_VALS(I)) + TO_IM(2.2D0) )
```

```
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 34
```

```
CALL ARG$(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
X1 = EXP( X_VALS(I)) + TO_IM('2.3') )
```

```
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 35
```

```
CALL ARG$(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
X1 = EXP( X_VALS(I)) + TO_IM(TO_ZM('2.4+2.5i')) )
```

```
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 36
```

```
CALL ARG$(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
X1 = EXP( X_VALS(I)) + TO_IM(TO_ZM('2.5D0+2.6D0i')) )
```

```
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 37
```

```
CALL ARG$(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
X1 = EXP( X_VALS(I)) + TO_IM(X_VALS(I)/10) )
```

```
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 38
```

```
CALL ARG$(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
X1 = EXP( X_VALS(I)) + TO_IM(TO_IM(2)) )
```

```
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 39
```

```
CALL ARG$(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
X1 = EXP( X_VALS(I)) + TO_IM(TO_ZM('2.01+2.01i')) )
```

```
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 40
```

```
CALL ARG$(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
X1 = INT( X_VALS(I)) )
```

```
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 41
```

```
CALL ARG$(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
X1 = NINT( X_VALS(I)) )
```

```
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 42
```

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = FLOOR( (X_VALS(I)) )
CALL OUTPUT(I,N_CASE,X1)
```

N_CASE = 43

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = CEILING( (X_VALS(I)) )
CALL OUTPUT(I,N_CASE,X1)
```

N_CASE = 44

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = MOD( X_VALS(J) , X_VALS(K) )
CALL OUTPUT(I,N_CASE,X1)
```

N_CASE = 45

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = MOD( TO_IM(X_VALS(J)) + 12345678 , TO_IM(X_VALS(K)) + 1234 )
CALL OUTPUT(I,N_CASE,X1)
```

N_CASE = 46

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = GCD( TO_IM(X_VALS(J)) + 12345678 , TO_IM(X_VALS(K)) + 1234 )
CALL OUTPUT(I,N_CASE,X1)
```

N_CASE = 47

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = FACTORIAL( (X_VALS(I)) )
CALL OUTPUT(I,N_CASE,X1)
```

N_CASE = 48

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = GAMMA( (X_VALS(I)) )
CALL OUTPUT(I,N_CASE,X1)
```

N_CASE = 49

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = GAMMA( (X_VALS(I)) + 1 )
CALL OUTPUT(I,N_CASE,X1)
```

N_CASE = 50

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,0.0,1001.0,J,K)
X1 = LOG_GAMMA( (X_VALS(J)) )
CALL OUTPUT(I,N_CASE,X1)
```

N_CASE = 51

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = BINOMIAL( X_VALS(J) , X_VALS(K) )
CALL OUTPUT(I,N_CASE,X1)
```

N_CASE = 52

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
CALL FM_EULER(X1)
CALL OUTPUT(I,N_CASE,X1)
```

N_CASE = 53

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = BERNOULLI( TO_INT(ABS(X_VALS(I))) + 12 + I )
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 54
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = BETA( X_VALS(J) , X_VALS(K) )
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 55
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,0.0,1001.0,J,K)
X1 = PSI( (X_VALS(J)) + TO_FM('0.12345') )
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 56
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,0.0,1001.0,J,K)
X1 = POLYGAMMA( I , (X_VALS(J)) + TO_FM('0.12345') )
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 57
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,0.0,1001.0,J,K)
X1 = POCHHAMMER( (X_VALS(J)) + TO_FM('0.12345') , I )
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 58
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,0.0,1001.0,J,K)
X1 = INCOMPLETE_GAMMA1( X_VALS(J) , X_VALS(K) )
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 59
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,0.0,1001.0,J,K)
X1 = INCOMPLETE_GAMMA2( X_VALS(J) , X_VALS(K) )
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 60
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = BESSEL_J( I , (X_VALS(I)) + TO_FM('0.12345') )
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 61
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,0.0,1001.0,J,K)
X1 = BESSEL_Y( I , (X_VALS(J)) + TO_FM('0.12345') )
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 62
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = BESSEL_J0( (X_VALS(I)) )
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 63
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = BESSEL_J1( (X_VALS(I)) )
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 64
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,0.0,1001.0,J,K)
X1 = BESSEL_Y0( (X_VALS(J)) )
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 65
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,0.0,1001.0,J,K)
```

```
X1 = BESSEL_Y1( (X_VALS(J)) )  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 66  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,0.0,1001.0,J,K)  
X1 = COS_INTEGRAL( (X_VALS(J)) )  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 67  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,0.0,1001.0,J,K)  
X1 = COSH_INTEGRAL( (X_VALS(J)) )  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 68  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)  
X1 = ERF( (X_VALS(I)) )  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 69  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)  
X1 = ERFC( (X_VALS(I)) )  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 70  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)  
X1 = ERFC_SCALED( (X_VALS(I)) )  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 71  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)  
X1 = EXP_INTEGRAL_EI( (X_VALS(I)) )  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 72  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,0.0,1001.0,J,K)  
X1 = EXP_INTEGRAL_EN( I , (X_VALS(J)) )  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 73  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)  
X1 = FRESNEL_C( (X_VALS(I)) )  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 74  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)  
X1 = FRESNEL_S( (X_VALS(I)) )  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 75  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,0.0,1001.0,J,K)  
X2 = TO_FM(I) / (2*N_VALS+1)  
X1 = INCOMPLETE_BETA( X2, X_VALS(J) , X_VALS(K) )  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 76  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)  
X1 = LOG_ERFC( (X_VALS(I)) )  
CALL OUTPUT(I,N_CASE,X1)
```



```

N_CASE = 77
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,0.0,1001.0,J,K)
X1 = LOG_INTEGRAL( (X_VALS(J)) )
CALL OUTPUT(I,N_CASE,X1)

N_CASE = 78
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = SIN_INTEGRAL( (X_VALS(I)) )
CALL OUTPUT(I,N_CASE,X1)

N_CASE = 79
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = SINH_INTEGRAL( (X_VALS(I)) )
CALL OUTPUT(I,N_CASE,X1)

N_CASE = 80
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
IF (X_VALS(J) == X_VALS(K)) THEN
    X1 = X_VALS(J)
ELSE
    X1 = X_VALS(K)
ENDIF
CALL OUTPUT(I,N_CASE,X1)

N_CASE = 81
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
IF (X_VALS(J) /= X_VALS(K)) THEN
    X1 = X_VALS(J)
ELSE
    X1 = X_VALS(K)
ENDIF
CALL OUTPUT(I,N_CASE,X1)

N_CASE = 82
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
IF (X_VALS(J) < X_VALS(K)) THEN
    X1 = X_VALS(J)
ELSE
    X1 = X_VALS(K)
ENDIF
CALL OUTPUT(I,N_CASE,X1)

N_CASE = 83
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
IF (X_VALS(J) <= X_VALS(K)) THEN
    X1 = X_VALS(J)
ELSE
    X1 = X_VALS(K)
ENDIF
CALL OUTPUT(I,N_CASE,X1)

N_CASE = 84
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
IF (X_VALS(J) > X_VALS(K)) THEN
    X1 = X_VALS(J)
ELSE
    X1 = X_VALS(K)

```

```

ENDIF
CALL OUTPUT(I,N_CASE,X1)

N_CASE = 85
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
IF (X_VALS(J) >= X_VALS(K)) THEN
    X1 = X_VALS(J)
ELSE
    X1 = X_VALS(K)
ENDIF
CALL OUTPUT(I,N_CASE,X1)

N_CASE = 86
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
I1 = TO_IM(TO_FM('1.0D+41')*X_VALS(J)) + TO_IM(TO_FM('1.0D+43')*X_VALS(K))
CALL OUTPUT_IM(I,N_CASE,I1)

N_CASE = 87
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
I1 = TO_IM(TO_FM('1.0D+41')*X_VALS(J)) - TO_IM(TO_FM('1.0D+43')*X_VALS(K))
CALL OUTPUT_IM(I,N_CASE,I1)

N_CASE = 88
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
I1 = TO_IM(TO_FM('1.0D+41')*X_VALS(J)) * TO_IM(TO_FM('1.0D+43')*X_VALS(K))
CALL OUTPUT_IM(I,N_CASE,I1)

N_CASE = 89
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
I1 = TO_IM(TO_FM('1.0D+41')*X_VALS(J)) / TO_IM(TO_FM('1.0D+43')*X_VALS(K))
CALL OUTPUT_IM(I,N_CASE,I1)

N_CASE = 90
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
IF (TO_IM(TO_FM('1.0D+41')*X_VALS(J)) == TO_IM(TO_FM('1.0D+43')*X_VALS(K))) THEN
    I1 = TO_IM(TO_FM('1.0D+41')*X_VALS(J))
ELSE
    I1 = TO_IM(TO_FM('1.0D+43')*X_VALS(K))
ENDIF
CALL OUTPUT_IM(I,N_CASE,I1)

N_CASE = 91
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
IF (TO_IM(TO_FM('1.0D+41')*X_VALS(J)) /= TO_IM(TO_FM('1.0D+43')*X_VALS(K))) THEN
    I1 = TO_IM(TO_FM('1.0D+41')*X_VALS(J))
ELSE
    I1 = TO_IM(TO_FM('1.0D+43')*X_VALS(K))
ENDIF
CALL OUTPUT_IM(I,N_CASE,I1)

N_CASE = 92
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
IF (TO_IM(TO_FM('1.0D+41')*X_VALS(J)) <= TO_IM(TO_FM('1.0D+43')*X_VALS(K))) THEN
    I1 = TO_IM(TO_FM('1.0D+41')*X_VALS(J))
ELSE
    I1 = TO_IM(TO_FM('1.0D+43')*X_VALS(K))
ENDIF
CALL OUTPUT_IM(I,N_CASE,I1)

```

```

N_CASE = 93
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
IF (TO_IM(TO_FM('1.0D+41')*X_VALS(J)) < TO_IM(TO_FM('1.0D+43')*X_VALS(K))) THEN
    I1 = TO_IM(TO_FM('1.0D+41')*X_VALS(J))
ELSE
    I1 = TO_IM(TO_FM('1.0D+43')*X_VALS(K))
ENDIF
CALL OUTPUT_IM(I,N_CASE,I1)

N_CASE = 94
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
IF (TO_IM(TO_FM('1.0D+41')*X_VALS(J)) >= TO_IM(TO_FM('1.0D+43')*X_VALS(K))) THEN
    I1 = TO_IM(TO_FM('1.0D+41')*X_VALS(J))
ELSE
    I1 = TO_IM(TO_FM('1.0D+43')*X_VALS(K))
ENDIF
CALL OUTPUT_IM(I,N_CASE,I1)

N_CASE = 95
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
IF (TO_IM(TO_FM('1.0D+41')*X_VALS(J)) > TO_IM(TO_FM('1.0D+43')*X_VALS(K))) THEN
    I1 = TO_IM(TO_FM('1.0D+41')*X_VALS(J))
ELSE
    I1 = TO_IM(TO_FM('1.0D+43')*X_VALS(K))
ENDIF
CALL OUTPUT_IM(I,N_CASE,I1)

N_CASE = 96
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
I1 = ABS(TO_IM(TO_FM('1.0D+41')*(X_VALS(I))))
CALL OUTPUT_IM(I,N_CASE,I1)

N_CASE = 97
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
I1 = BINOMIAL(TO_IM(100),TO_IM(50))
CALL OUTPUT_IM(I,N_CASE,I1)

N_CASE = 98
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
I1 = CEILING(TO_IM(TO_FM('1.0D+41')*(X_VALS(I))))
CALL OUTPUT_IM(I,N_CASE,I1)

N_CASE = 99
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
I1 = DIGITS(TO_IM(TO_FM('1.0D+41')*(X_VALS(I))))
CALL OUTPUT_IM(I,N_CASE,I1)

N_CASE = 100
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
I1 = DIM(TO_IM(TO_FM('1.0D+41')*X_VALS(J)),TO_IM(TO_FM('1.0D+43')*X_VALS(K)))
CALL OUTPUT_IM(I,N_CASE,I1)

N_CASE = 101
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
I1 = FACTORIAL(TO_IM(50))
CALL OUTPUT_IM(I,N_CASE,I1)

```

N_CASE = 102

CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)

I1 = FLOOR(TO_IM(TO_FM('1.0D+41')*(X_VALS(I))))

CALL OUTPUT_IM(I,N_CASE,I1)

N_CASE = 103

CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)

I1 = GCD(TO_IM(TO_FM('1.0D+41')*X_VALS(J)) , TO_IM(TO_FM('1.0D+43')*X_VALS(K)))

CALL OUTPUT_IM(I,N_CASE,I1)

N_CASE = 104

CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)

I1 = INT(TO_IM(TO_FM('1.0D+41')*(X_VALS(I))))

CALL OUTPUT_IM(I,N_CASE,I1)

N_CASE = 105

CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)

I1 = MAX(TO_IM(TO_FM('1.0D+41')*X_VALS(J)) , TO_IM(TO_FM('1.0D+43')*X_VALS(K)))

CALL OUTPUT_IM(I,N_CASE,I1)

N_CASE = 106

CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)

I1 = MIN(TO_IM(TO_FM('1.0D+41')*X_VALS(J)) , TO_IM(TO_FM('1.0D+43')*X_VALS(K)))

CALL OUTPUT_IM(I,N_CASE,I1)

N_CASE = 107

CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)

I1 = MOD(TO_IM(TO_FM('1.0D+41')*X_VALS(J)) , TO_IM(TO_FM('1.0D+43')*X_VALS(K)))

CALL OUTPUT_IM(I,N_CASE,I1)

N_CASE = 108

CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)

I1 = MODULO(TO_IM(TO_FM('1.0D+41')*X_VALS(J)) , TO_IM(TO_FM('1.0D+43')*X_VALS(K)))

CALL OUTPUT_IM(I,N_CASE,I1)

N_CASE = 109

CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)

I1 = MULTIPLY_MOD(TO_IM(TO_FM('1.0D+41')*X_VALS(J)) , TO_IM(TO_FM('1.0D+43')*X_VALS(K)) , &
TO_IM('1234567'))

CALL OUTPUT_IM(I,N_CASE,I1)

N_CASE = 110

CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)

I1 = NINT(TO_IM(TO_FM('1.0D+41')*(X_VALS(I))))

CALL OUTPUT_IM(I,N_CASE,I1)

N_CASE = 111

CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)

I1 = POWER_MOD(ABS(TO_IM(TO_FM('1.0D+41')*X_VALS(J))) , &
ABS(TO_IM(TO_FM('1.0D+43')*X_VALS(K))) , TO_IM('1234567'))

CALL OUTPUT_IM(I,N_CASE,I1)

N_CASE = 112

CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)

I1 = RADIX(TO_IM(TO_FM('1.0D+41')*(X_VALS(I))))

CALL OUTPUT_IM(I,N_CASE,I1)

N_CASE = 113

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
I1 = RANGE(TO_IM(TO_FM('1.0D+41')*(X_VALS(I))))
CALL OUTPUT_IM(I,N_CASE,I1)
```

N_CASE = 114

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
I1 = SIGN(TO_IM(TO_FM('1.0D+41')*X_VALS(J)) , TO_IM(TO_FM('1.0D+43')*X_VALS(K)))
CALL OUTPUT_IM(I,N_CASE,I1)
```

N_CASE = 115

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
I1 = TINY(TO_IM(TO_FM('1.0D+41')*(X_VALS(I))))
CALL OUTPUT_IM(I,N_CASE,I1)
```

N_CASE = 116

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = ABS( X_VALS(I) )
CALL OUTPUT(I,N_CASE,X1)
```

N_CASE = 117

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = AINT( X_VALS(I) )
CALL OUTPUT(I,N_CASE,X1)
```

N_CASE = 118

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = ANINT( X_VALS(I) )
CALL OUTPUT(I,N_CASE,X1)
```

N_CASE = 119

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = ATAN2( X_VALS(J) , X_VALS(K) )
CALL OUTPUT(I,N_CASE,X1)
```

N_CASE = 120

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = CEILING( X_VALS(I) )
CALL OUTPUT(I,N_CASE,X1)
```

N_CASE = 121

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = DBLE( X_VALS(I) )
CALL OUTPUT(I,N_CASE,X1)
```

N_CASE = 122

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = DIGITS( X_VALS(I) )
CALL OUTPUT(I,N_CASE,X1)
```

N_CASE = 123

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = DIM( X_VALS(J) , X_VALS(K) )
CALL OUTPUT(I,N_CASE,X1)
```

N_CASE = 124

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = DINT( X_VALS(I) )
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 125
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = EPSILON( (X_VALS(I)) )
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 126
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = EXPONENT( (X_VALS(I)) )
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 127
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = FLOOR( (X_VALS(I)) )
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 128
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = FRACTION( (X_VALS(I)) )
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 129
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = HUGE( (X_VALS(I)) )
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 130
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = HYPOT( X_VALS(J) , X_VALS(K) )
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 131
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = INT( (X_VALS(I)) )
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 132
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,0.0,1001.0,J,K)
X1 = LOG10( (X_VALS(J)) )
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 133
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = MAX( X_VALS(J) , X_VALS(K) )
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 134
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = MIN( X_VALS(J) , X_VALS(K) )
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 135
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
X1 = MAXEXPONENT( (X_VALS(I)) )
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 136
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
X1 = MINEXPONENT( (X_VALS(I)) )  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 137  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)  
X1 = MODULO( X_VALS(J) , X_VALS(K) )  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 138  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)  
X1 = NEAREST( X_VALS(J) , X_VALS(K) )  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 139  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)  
X1 = NINT( (X_VALS(I)) )  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 140  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)  
X1 = PRECISION( (X_VALS(I)) )  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 141  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)  
X1 = RADIX( (X_VALS(I)) )  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 142  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)  
X1 = RANGE( (X_VALS(I)) )  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 143  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)  
X1 = RRSPPACING( (X_VALS(I)) )  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 144  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)  
X1 = SCALE( (X_VALS(I)) , 4 )  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 145  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)  
X1 = SIGN( X_VALS(J) , X_VALS(K) )  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 146  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)  
X1 = SPACING( (X_VALS(I)) )  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 147  
CALL ARG(S(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)  
CALL FM_COSH_SINH( (X_VALS(I)) , X1 , X2 )  
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 148
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
CALL FM_COSH_SINH( (X_VALS(I)) , X1 , X2 )
CALL OUTPUT(I,N_CASE,X2)
```

```
N_CASE = 149
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
CALL FM_COS_SIN( (X_VALS(I)) , X1 , X2 )
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 150
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
CALL FM_COS_SIN( (X_VALS(I)) , X1 , X2 )
CALL OUTPUT(I,N_CASE,X2)
```

```
N_CASE = 151
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
CALL FM_ULP( (X_VALS(I)) , X1 )
CALL OUTPUT(I,N_CASE,X1)
```

```
N_CASE = 152
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
N_CASE = N_CASE + 1
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
Z3 = CMPLX( X_VALS(J) , X_VALS(K) )
Z1 = Z2 + Z3
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
CALL OUTPUT(I,N_CASE,AIMAG(Z1))
```

```
N_CASE = 154
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
N_CASE = N_CASE + 1
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
Z3 = CMPLX( X_VALS(J) , X_VALS(K) )
Z1 = Z2 - Z3
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
CALL OUTPUT(I,N_CASE,AIMAG(Z1))
```

```
N_CASE = 156
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
N_CASE = N_CASE + 1
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
Z3 = CMPLX( X_VALS(J) , X_VALS(K) )
Z1 = Z2 * Z3
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
CALL OUTPUT(I,N_CASE,AIMAG(Z1))
```

```
N_CASE = 158
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
N_CASE = N_CASE + 1
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
Z3 = CMPLX( X_VALS(J) , X_VALS(K) )
Z1 = Z2 / Z3
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
```



```
CALL OUTPUT(I,N_CASE,AIMAG(Z1))
```

```
N_CASE = 160
```

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
```

```
N_CASE = N_CASE + 1
```

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
Z3 = CMPLX( X_VALS(J) , X_VALS(K) )
```

```
Z1 = Z2 ** Z3
```

```
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
```

```
CALL OUTPUT(I,N_CASE,AIMAG(Z1))
```

```
N_CASE = 162
```

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
```

```
Z1 = ABS(Z2)
```

```
N_CASE = N_CASE + 1
```

```
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
```

```
CALL OUTPUT(I,N_CASE,AIMAG(Z1))
```

```
N_CASE = 164
```

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
```

```
Z1 = ACOS(Z2)
```

```
N_CASE = N_CASE + 1
```

```
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
```

```
CALL OUTPUT(I,N_CASE,AIMAG(Z1))
```

```
N_CASE = 166
```

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
```

```
Z1 = ACOSH(Z2)
```

```
N_CASE = N_CASE + 1
```

```
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
```

```
CALL OUTPUT(I,N_CASE,AIMAG(Z1))
```

```
N_CASE = 168
```

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
```

```
Z1 = AINT(Z2)
```

```
N_CASE = N_CASE + 1
```

```
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
```

```
CALL OUTPUT(I,N_CASE,AIMAG(Z1))
```

```
N_CASE = 170
```

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
```

```
Z1 = ASIN(Z2)
```

```
N_CASE = N_CASE + 1
```

```
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
```

```
CALL OUTPUT(I,N_CASE,AIMAG(Z1))
```

```
N_CASE = 172
```

```
CALL ARGSC(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
```

```
Z1 = ASINH(Z2)
```

```
N_CASE = N_CASE + 1
```

```
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
```

```
CALL OUTPUT(I,N_CASE,AIMAG(Z1))
```

```
N_CASE = 174
```

```
CALL ARGS(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
```

```
Z1 = ATAN(Z2)
```

```
N_CASE = N_CASE + 1
```

```
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
```

```
CALL OUTPUT(I,N_CASE,AIMAG(Z1))
```

```
N_CASE = 176
```

```
CALL ARGS(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
```

```
Z1 = ATANH(Z2)
```

```
N_CASE = N_CASE + 1
```

```
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
```

```
CALL OUTPUT(I,N_CASE,AIMAG(Z1))
```

```
N_CASE = 178
```

```
CALL ARGS(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
```

```
Z1 = CEILING(Z2)
```

```
N_CASE = N_CASE + 1
```

```
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
```

```
CALL OUTPUT(I,N_CASE,AIMAG(Z1))
```

```
N_CASE = 180
```

```
CALL ARGS(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
```

```
Z1 = CONJG(Z2)
```

```
N_CASE = N_CASE + 1
```

```
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
```

```
CALL OUTPUT(I,N_CASE,AIMAG(Z1))
```

```
N_CASE = 182
```

```
CALL ARGS(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
```

```
Z1 = COS(Z2)
```

```
N_CASE = N_CASE + 1
```

```
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
```

```
CALL OUTPUT(I,N_CASE,AIMAG(Z1))
```

```
N_CASE = 184
```

```
CALL ARGS(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
```

```
Z1 = COSH(Z2)
```

```
N_CASE = N_CASE + 1
```

```
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
```

```
CALL OUTPUT(I,N_CASE,AIMAG(Z1))
```

```
N_CASE = 186
```

```
CALL ARGS(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
```

```
Z1 = DBLE(Z2)
```

```
N_CASE = N_CASE + 1
```

```
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
```

```
CALL OUTPUT(I,N_CASE,AIMAG(Z1))
```

```
N_CASE = 188
CALL ARG$$(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
Z1 = DIGITS(Z2)
N_CASE = N_CASE + 1
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
CALL OUTPUT(I,N_CASE,AIMAG(Z1))
```

```
N_CASE = 190
CALL ARG$$(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
Z1 = DINT(Z2)
N_CASE = N_CASE + 1
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
CALL OUTPUT(I,N_CASE,AIMAG(Z1))
```

```
N_CASE = 192
CALL ARG$$(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
Z1 = ERF(Z2)
N_CASE = N_CASE + 1
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
CALL OUTPUT(I,N_CASE,AIMAG(Z1))
```

```
N_CASE = 194
CALL ARG$$(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
Z1 = ERFC(Z2)
N_CASE = N_CASE + 1
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
CALL OUTPUT(I,N_CASE,AIMAG(Z1))
```

```
N_CASE = 196
CALL ARG$$(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
Z1 = ERFC_SCALED(Z2)
N_CASE = N_CASE + 1
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
CALL OUTPUT(I,N_CASE,AIMAG(Z1))
```

```
N_CASE = 198
CALL ARG$$(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
Z1 = EXP(Z2)
N_CASE = N_CASE + 1
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
CALL OUTPUT(I,N_CASE,AIMAG(Z1))
```

```
N_CASE = 200
CALL ARG$$(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
Z1 = FACTORIAL(Z2)
N_CASE = N_CASE + 1
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
CALL OUTPUT(I,N_CASE,AIMAG(Z1))
```

```
N_CASE = 202
CALL ARG$$(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
```

```

Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
Z1 = FLOOR(Z2)
N_CASE = N_CASE + 1
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
CALL OUTPUT(I,N_CASE,AIMAG(Z1))

N_CASE = 204
CALL ARGS(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
Z1 = FRACTION(Z2)
N_CASE = N_CASE + 1
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
CALL OUTPUT(I,N_CASE,AIMAG(Z1))

N_CASE = 206
CALL ARGS(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
Z1 = GAMMA(Z2)
N_CASE = N_CASE + 1
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
CALL OUTPUT(I,N_CASE,AIMAG(Z1))

N_CASE = 208
CALL ARGS(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
Z1 = HUGE(Z2)
N_CASE = N_CASE + 1
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
CALL OUTPUT(I,N_CASE,AIMAG(Z1))

N_CASE = 210
CALL ARGS(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
Z1 = INT(Z2)
N_CASE = N_CASE + 1
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
CALL OUTPUT(I,N_CASE,AIMAG(Z1))

N_CASE = 212
CALL ARGS(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
Z1 = LOG(Z2)
N_CASE = N_CASE + 1
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
CALL OUTPUT(I,N_CASE,AIMAG(Z1))

N_CASE = 214
CALL ARGS(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
Z1 = LOG10(Z2)
N_CASE = N_CASE + 1
CALL OUTPUT(I,N_CASE-1,REAL(Z1))
CALL OUTPUT(I,N_CASE,AIMAG(Z1))

N_CASE = 216
CALL ARGS(I,N_CASE,MAX_CASE,N_VALS,X_VALS,RAN,-1001.0,1001.0,J,K)
Z2 = CMPLX( X_VALS(J) , X_VALS(K) )
Z1 = LOG_GAMMA(Z2)

```