

# FORTRAN FORMULAS & FUNCTIONS - Prof. Richard B. Goldstein

## To Integer

INT(2.8)=	2
IFIX(2.8)=	2
IDINT(4.3184D3)=	4318

## To Real

REAL(4.3)=	4.30000
FLOAT(4.3)=	4.30000
SNGL(4.3184D3)=	4318.40
REAL(3.5,1.8)=	3.50000

## To Double Precision

DBLE(4)=	4.000000000000000
DBLE(4.2)=	4.19999989026514

## To Complex

CMPLX(5)=	( .500000E+01, .000000E+00)
CMPLX(4.8)=	( .480000E+01, .000000E+00)
CMPLX(4.814D2)=	( .481400E+03, .000000E+00)

## Character conversions (uses ASCII format)

ICHAR('B')=	66
CHAR(66)=	B

## Truncation (Integer Part)

AINT(2.8)=	2.00000
DINT(2.817D2)=	281.0000000000000

## Nearest Whole Number (Round)

ANINT(2.8)=	3.00000
DNINT(2.817D2)=	282.0000000000000

## Nearest Integer

NINT(2.8)=	3
IDNINT(2.817D2)=	282

## Absolute Value

IABS(-6)=	6
ABS(-6.3)=	6.30000
DABS(-6.314D2)=	631.4000000000000
CABS(3,4)=	5.00000

## Modula Arithmetic: $a_1 - [a_1/a_2]*a_2$

MOD(7,3)=	1
AMOD(7.2,2.8)=	1.60000
DMOD(7.2D0,2.8D0)=	1.600000000000000

## Transfer of Sign: $|a_1|$ if $a_2 \geq 0$ , $-|a_1|$

ISIGN(4,-3)=	-4
SIGN(4.2,-3.4)=	-4.20000
DSIGN(4.2D0,-3.4D0)=	-4.200000000000000

Positive Difference:  $a_1 - a_2$  if  $a_1 > a_2$ , 0 if  $a_1 \leq a_2$

```
IDIM(7,2)= 5
DIM(7.2,9.0)= .00000
DDIM(7.2D0,6.3D0)= .9000000000000000
```

Double Precision Product:  $a_1 * a_2$

```
DPROD(1.8,3.6)= 6.47999965667725
```

Maximum

```
MAX0(4,6,1)= 6
AMAX1(4.1,6.3,1.2)= 6.30000
DMAX1(4.1D0,6.3D0,1.2D0)= 6.3000000000000000
AMAX0(4,6,1)= 6.00000
MAX1(4.1,6.3,1.2)= 6
```

Minimum

```
MIN0(4,6,1)= 1
AMIN1(4.1,6.3,1.2)= 1.2000000000000000
DMIN1(4.1D0,6.3D0,1.2D0)= 1.00000
AMIN0(4,6,1)= 1
MIN1(4.1,6.3,1.2)= 1
```

Length of a character string

```
LEN('Help')= 4
```

Location of a substring

```
INDEX('Calculus','al')= 2
```

Imaginary part of a complex number

```
AIMAG((3.2,4.8))= 4.80000
```

Complex conjugate

```
CONJG((4.8,1.6))= (.480000E+01, -.160000E+01)
```

Square Root

```
DSQRT(0.6)= .774597
DSQRT(0.6D0)= .774596669241483
CSQRT((0.6,0.2))= (.785002E+00, .127388E+00)
```

Exponential

```
EXP(0.6)= 1.82212
DEXP(0.6D0)= 1.82211880039051
CEXP((0.6,0.2))= (.178580E+01, .361999E+00)
```

Natural Logarithm

```
ALOG(0.6)= -.510826
DLOG(0.6D0)= -.510825623765991
CLOG((0.6,0.2))= (-.4458145E+00, .321751E+00)
```

Common Logarithm

```
ALOG10(0.6)= -.221849
DLOG10(0.6D0)= -.221848749616356
```

Sine

```
SIN(0.6)= .564642
DSIN(0.6D0)= .564642473395035
CSIN((0.6,0.2))= ( .575973E+00, .166170E+00)
```

Cosine

```
COS(0.6)= .825336
DCOS(0.6D0)= .825335614909678
CCOS((0.6,0.2))= ( .841897E+00, -.113683E+00)
```

Tangent

```
TAN(0.6)= .684137
DTAN(0.6D0)= .684136808341692
```

Arcsine

```
ASIN(0.6)= .643501
DASIN(0.6D0)= .643501108793284
```

Arccosine

```
ACOS(0.6)= .927296
DACOS(0.6D0)= .927295218001612
```

Arctangent (note ATAN2 = arctan(a<sub>1</sub>/a<sub>2</sub>))

```
ATAN(0.6)= .540420
DATAN(0.6D0)= .540419500270584
ATAN2(0.6,0.3)= 1.10715
DATAN2(0.6D0)= 1.10714871779409
```

Hyperbolic Sine

```
SINH(0.6)= .636654
DSINH(0.6D0)= .636653582148241
```

Hyperbolic Cosine

```
COSH(0.6)= 1.18547
DCOSH(0.6D0)= 1.18456521824227
```

Hyperbolic Tangent

```
TANH(0.6)= .537050
DTANH(0.6D0)= .537049566998035
```

Character String Comparisons (LGE ≥, LGT >, LLE ≤, LLT <)

```
LGE('Apple','Banana')= F
LGT('Apple','Banana')= F
LLE('Apple','Banana')= T
LLT('Apple','Banana')= T
```