NAME

csqrt, **csqrtf**, **csqrtl** - complex square root functions

LIBRARY

Math Library (libm, -lm)

SYNOPSIS

#include <complex.h>

double complex
csqrt(*double complex z*);

float complex
csqrtf(*float complex z*);

long double complex
csqrtl(*long double complex z*);

DESCRIPTION

The **csqrt**(), **csqrtf**(), and **csqrtl**() functions compute the square root of *z* in the complex plane, with a branch cut along the negative real axis. In other words, **csqrt**(), **csqrtf**(), and **csqrtl**() always return the square root whose real part is non-negative.

RETURN VALUES

These functions return the requested square root. The square root of 0 is +0 +- 0, where the imaginary parts of the input and respective result have the same sign. For infinities and NaNs, the following rules apply, with the earlier rules having precedence:

Input	*Result*	
k + infinity*I	infinity + infinity*I	(for all k)
-infinity + NaN*I	NaN +- infinity*I	
infinity + NaN*I	infinity + NaN*I	
k + NaN*I	NaN + NaN*I	
NaN + k*I	NaN + NaN*I	
-infinity + k*I	+0 + infinity*I	
infinity + k*I	infinity + 0*I	

For numbers with negative imaginary parts, the above special cases apply given the identity:

csqrt(conj(z)) = conj(csqrt(z))

Note that the sign of NaN is indeterminate. Also, if the real or imaginary part of the input is finite and

an NaN is generated, an invalid exception will be thrown.

SEE ALSO

cabs(3), fenv(3), math(3)

STANDARDS

The **csqrt**(), **csqrtf**(), and **csqrtl**() functions conform to ISO/IEC 9899:1999 ("ISO C99").

BUGS

For **csqrt**() and **csqrtl**(), inexact results are not always correctly rounded.