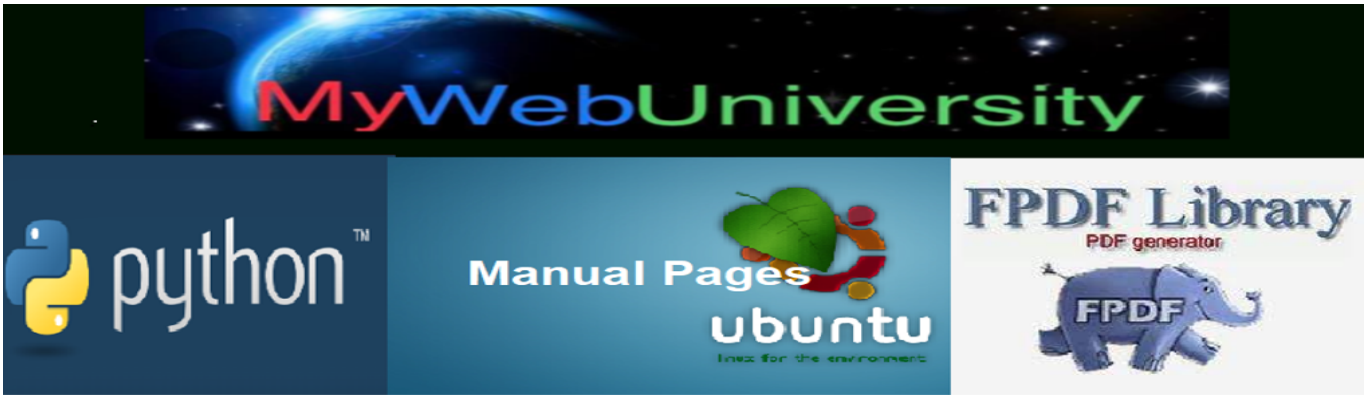

Rocky Enterprise Linux 9.2 Manual Pages on command 'complex.7'

$ man complex.7

COMPLEX(7) Linux Programmer's Manual COMPLEX(7)

NAME

complex - basics of complex mathematics

SYNOPSIS

#include <complex.h>

DESCRIPTION

Complex numbers are numbers of the form z = a+b*i, where a and b are real numbers and i = sqrt(-1), so that i*i = -1.

There are other ways to represent that number. The pair (a,b) of real numbers may be viewed as a point in the plane, given by X- and Y-coordinates. This same point may also be described by giving the pair of real numbers (r,phi), where r is the distance to the origin O, and phi the angle between the X-axis and the line Oz. Now z = r*exp(i*phi) = r*(cos(phi)+i*sin(phi)).

The basic operations are defined on z = a+b*i and w = c+d*i as:

addition: z+w = (a+c) + (b+d)*i

multiplication: z*w = (a*c - b*d) + (a*d + b*c)*i

division: z/w = ((a*c + b*d)/(c*c + d*d)) + ((b*c - a*d)/(c*c + d*d))*i

Nearly all math function have a complex counterpart but there are some complex-only func? tions.

EXAMPLES

Your C-compiler can work with complex numbers if it supports the C99 standard. Link with -lm. The imaginary unit is represented by I.

/* check that exp(i * pi) == -1 */

```
#include <math.h>        /* for atan */
#include <stdio.h>
#include <complex.h>
int
main(void)
{
   double pi = 4 * atan(1.0);
   double complex z = cexp(I * pi);
   printf("%f + %f * i\n", creal(z), cimag(z));
}
```

SEE ALSO

cabs(3), cacos(3), cacosh(3), carg(3), casin(3), casinh(3), catan(3), catanh(3), ccos(3), ccosh(3), cerf(3), cexp(3), cexp2(3), cimag(3), clog(3), clog10(3), clog2(3), conj(3), cpow(3), cproj(3), creal(3), csin(3), csinh(3), csqrt(3), ctan(3), ctanh(3)

COLOPHON

This page is part of release 5.10 of the Linux man-pages project. A description of the project, information about reporting bugs, and the latest version of this page, can be found at https://www.kernel.org/doc/man-pages/.

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