



Adapted from C++ How To Program edited for our own purposes

Math Library Functions

Remember, C++ programs are typically written by combining new functions and classes you write with “prepackaged” functions and classes available in the C++ Standard Library. The C++ Standard Library provides a rich collection of functions for common mathematical calculations, string manipulations, character manipulations, input/output, error checking and many other useful operations.

Sometimes functions, such as `main`, are not members of a class. Such functions are called global functions. Like a class’s member functions, the function prototypes for global functions are placed in headers, so that the global functions can be reused in any program that includes the header and that can link to the function’s object code.

The `<cmath>` header provides a collection of functions that enable you to perform common mathematical calculations. For example, you can calculate the square root of 900.0 with the function call

```
sqrt( 900.0 )
```

The preceding expression evaluates to 30.0. Function `sqrt` takes an argument of type `double` and returns a `double` result. There’s no need to create any objects before calling function `sqrt`. Also, all functions in the `<cmath>` header are global functions—therefore, each is called simply by specifying the name of the function followed by parentheses containing the function’s arguments.

Function arguments may be constants, variables or more complex expressions.

Some math library functions

<code>ceil(x)</code>	rounds x to the smallest integer not less than x	<code>ceil(9.2)</code> is 10.0 <code>ceil(-9.8)</code> is -9.0
<code>cos(x)</code>	trigonometric cosine of x (x in radians)	<code>cos(0.0)</code> is 1.0
<code>exp(x)</code>	exponential function e^x	<code>exp(1.0)</code> is 2.718282 <code>exp(2.0)</code> is 7.389056