MATHEMATICAL FUNCTIONS IN THE STANDARD C++ LIBRARY

● Calling Procedure

To access the mathematical functions in the standard library, add the header:

```
#include<cmath>
```

● Mathematical Functions by Type

✓ Rounding:

- `double ceil(double x)` Round up
- `double floor(double x)` Round down

✓ Absolute Values:

- `double fabs(double x)` Returns absolute value $|x|$ (floating-point variable)
- `int abs(int n)` Returns absolute value $|n|$ (integer variable)
- `long labs(long n)` Returns absolute value $|n|$ (long integer variable)

✓ Modulo Function:

- `double fmod(double x, double y)` Return remainder $x \text{ mod } y$ of floating point division (analogous to integer division with remainder)

✓ Root, Power, Exponential, and Logarithmic Functions:

- `double sqrt(double x)` Calculate the square root of $x$
- `double pow(double x, double y)` Calculate power $x^y$
- `double exp(double x)` Calculate exponential function $e^x$
- `double log(double x)` Calculate natural logarithm $\ln x$
- `double log10(double x)` Calculate logarithm to base 10 $\log_{10} x$

✓ Trigonometric Functions:

- `double sin(double x)` Calculate sine of argument $\sin x$
- `double cos(double x)` Calculate cosine of argument $\cos x$
- `double tan(double x)` Calculate tangent of argument $\tan x$

✓ Hyperbolic Functions:

- `double sinh(double x)` Calculate hyperbolic sine of argument $\sinh x$
- `double cosh(double x)` Calculate hyperbolic cosine of argument $\cosh x$
- `double tanh(double x)` Calculate hyperbolic tangent of argument $\tanh x$

✓ Inverse Trigonometric Functions:

- `double asin(double x)` Calculate arcsine of argument $\arcsin x$
- `double acos(double x)` Calculate arccosine of argument $\arccos x$
- `double atan(double x)` Calculate arctangent of argument $\arctan x$
- `double atan2(double y, double x)` Calculate polar angle of vector $(x, y)$ in range $[-\pi, \pi]$