

Mathematical Built-in Functions in Java

Java provides the Math class (java.lang.Math) containing many built-in mathematical functions.

1. BASIC ARITHMETIC FUNCTIONS

Math.abs(x) → Absolute value of x
Math.max(a,b) → Maximum of two numbers
Math.min(a,b) → Minimum of two numbers
Math.sqrt(x) → Square root of x
Math.cbrt(x) → Cube root of x
Math.pow(a,b) → a raised to the power b

2. ROUNDING FUNCTIONS

Math.round(x) → Rounds to nearest integer
Math.ceil(x) → Rounds UP to nearest integer
Math.floor(x) → Rounds DOWN to nearest integer
Math.rint(x) → Returns nearest integer (as double)

3. TRIGONOMETRIC FUNCTIONS (radians)

Math.sin(x) → Sine of x
Math.cos(x) → Cosine of x
Math.tan(x) → Tangent of x
Math.asin(x) → Arc sine of x
Math.acos(x) → Arc cosine of x
Math.atan(x) → Arc tangent of x

4. LOGARITHMIC & EXPONENTIAL FUNCTIONS

Math.log(x) → Natural logarithm (base e)
Math.log10(x) → Logarithm base 10
Math.exp(x) → e raised to power x

5. RANDOM & CONSTANTS

Math.random() → Random number (0.0 to 1.0)
Math.PI → Constant value of π (3.14159)
Math.E → Constant value of e (2.71828)

Example Program:

```
class MathFunctionsExample {  
    public static void main(String[] args) {  
        System.out.println("Absolute value: " + Math.abs(-20));  
        System.out.println("Square root: " + Math.sqrt(49));  
        System.out.println("Power: " + Math.pow(2, 5));  
        System.out.println("Max: " + Math.max(10, 25));  
        System.out.println("Ceil: " + Math.ceil(4.3));  
    }  
}
```