# Examples of java.lang.Math Methods

Here is an example program that exercises most of the routines in java.lang.Math. If your high school math is a little rusty, don't worry if you don't remember the exact meaning of logarithms or cosines. Just know that they're here in Java if you need them.

public class MathLibraryExample {  
  
 public static void main(String args[]) {  
   
 int i = 7;  
 int j = -9;  
 double x = 72.3;  
 double y = 0.34;  
   
 System.out.println("i is " + i);   
 System.out.println("j is " + j);  
 System.out.println("x is " + x);   
 System.out.println("y is " + y);  
   
 // The absolute value of a number is equal to   
 // the number if the number is positive or   
 // zero and equal to the negative of the number   
 // if the number is negative.  
   
 System.out.println("|" + i + "| is " + Math.abs(i));   
 System.out.println("|" + j + "| is " + Math.abs(j));  
 System.out.println("|" + x + "| is " + Math.abs(x));   
 System.out.println("|" + y + "| is " + Math.abs(y));  
  
 // Truncating and Rounding functions  
   
 // You can round off a floating point number   
 // to the nearest integer with round()  
 System.out.println(x + " is approximately " + Math.round(x));   
 System.out.println(y + " is approximately " + Math.round(y));   
  
 // The "ceiling" of a number is the   
 // smallest integer greater than or equal to  
 // the number. Every integer is its own   
 // ceiling.  
 System.out.println("The ceiling of " + i + " is " + Math.ceil(i));   
 System.out.println("The ceiling of " + j + " is " + Math.ceil(j));  
 System.out.println("The ceiling of " + x + " is " + Math.ceil(x));   
 System.out.println("The ceiling of " + y + " is " + Math.ceil(y));  
  
 // The "floor" of a number is the largest   
 // integer less than or equal to the number.  
 // Every integer is its own floor.  
 System.out.println("The floor of " + i + " is " + Math.floor(i));   
 System.out.println("The floor of " + j + " is " + Math.floor(j));  
 System.out.println("The floor of " + x + " is " + Math.floor(x));   
 System.out.println("The floor of " + y + " is " + Math.floor(y));  
  
 // Comparison operators  
  
 // min() returns the smaller of the two arguments you pass it  
 System.out.println("min(" + i + "," + j + ") is " + Math.min(i,j));   
 System.out.println("min(" + x + "," + y + ") is " + Math.min(x,y));   
 System.out.println("min(" + i + "," + x + ") is " + Math.min(i,x));   
 System.out.println("min(" + y + "," + j + ") is " + Math.min(y,j));   
  
 // There's a corresponding max() method   
 // that returns the larger of two numbers   
 System.out.println("max(" + i + "," + j + ") is " + Math.max(i,j));   
 System.out.println("max(" + x + "," + y + ") is " + Math.max(x,y));   
 System.out.println("max(" + i + "," + x + ") is " + Math.max(i,x));   
 System.out.println("max(" + y + "," + j + ") is " + Math.max(y,j));   
   
 // The Math library defines a couple   
 // of useful constants:  
 System.out.println("Pi is " + Math.PI);   
 System.out.println("e is " + Math.E);   
 // Trigonometric methods  
 // All arguments are given in radians  
   
 // Convert a 45 degree angle to radians  
 double angle = 45.0 \* 2.0 \* Math.PI/360.0;  
 System.out.println("cos(" + angle + ") is " + Math.cos(angle));   
 System.out.println("sin(" + angle + ") is " + Math.sin(angle));   
   
 // Inverse Trigonometric methods  
 // All values are returned as radians  
   
 double value = 0.707;  
  
 System.out.println("acos(" + value + ") is " + Math.acos(value));   
 System.out.println("asin(" + value + ") is " + Math.asin(value));   
 System.out.println("atan(" + value + ") is " + Math.atan(value));   
  
 // Exponential and Logarithmic Methods  
   
 // exp(a) returns e (2.71828...) raised   
 // to the power of a.   
 System.out.println("exp(1.0) is " + Math.exp(1.0));  
 System.out.println("exp(10.0) is " + Math.exp(10.0));  
 System.out.println("exp(0.0) is " + Math.exp(0.0));  
  
 // log(a) returns the natural   
 // logarithm (base e) of a.   
 System.out.println("log(1.0) is " + Math.log(1.0));  
 System.out.println("log(10.0) is " + Math.log(10.0));  
 System.out.println("log(Math.E) is " + Math.log(Math.E));  
  
 // pow(x, y) returns the x raised   
 // to the yth power.  
 System.out.println("pow(2.0, 2.0) is " + Math.pow(2.0,2.0));  
 System.out.println("pow(10.0, 3.5) is " + Math.pow(10.0,3.5));  
 System.out.println("pow(8, -1) is " + Math.pow(8,-1));  
  
 // sqrt(x) returns the square root of x.  
 for (i=0; i < 10; i++) {  
 System.out.println(  
 "The square root of " + i + " is " + Math.sqrt(i));  
 }  
  
   
 // Finally there's one Random method   
 // that returns a pseudo-random number   
 // between 0.0 and 1.0;  
   
 System.out.println("Here's one random number: " + Math.random());   
 System.out.println("Here's another random number: " + Math.random());  
  
 }  
  
}

[Previous](http://docs.google.com/39.html) | [Next](http://docs.google.com/41.html) | [Top](http://docs.google.com/index.html) | [Cafe au Lait](http://www.cafeaulait.org/)

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[elharo@metalab.unc.edu](mailto:elharo@metalab.unc.edu)

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