

JAVA.LANG.MATH.TANH METHOD

http://www.tutorialspoint.com/java/lang/math_tanh.htm

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Description

The **java.lang.Math.tanh** method returns hyperbolic tangent of a double value. The hyperbolic tangent of x is defined to be $(e^x - e^{-x}) / (e^x + e^{-x})$, in other words, $\sinh x / \cosh x$. Note that the absolute value of the exact tanh is always less than 1. Special cases:

- If the argument is NaN, then the result is NaN.
- If the argument is zero, then the result is a zero with the same sign as the argument.
- If the argument is positive infinity, then the result is +1.0.
- If the argument is negative infinity, then the result is -1.0.

The computed result must be within 2.5 ulps of the exact result. The result of tanh for any finite input must have an absolute value less than or equal to 1. Note that once the exact result of tanh is within 1/2 of an ulp of the limit value of ± 1 , correctly signed ± 1.0 should be returned.

Declaration

Following is the declaration for **java.lang.Math.tanh** method

```
public static double tanh(double x)
```

Parameters

- **x** -- The number whose hyperbolic tangent is to be returned.

Return Value

This method returns the hyperbolic tangent of x .

Exception

- **NA**

Example

The following example shows the usage of lang.Math.tanh method.

```
package com.tutorialspoint;

import java.lang.*;

public class MathDemo {

    public static void main(String[] args) {

        // get two double numbers numbers
        double x = 45;
        double y = -180;

        // convert them in radians
        x = Math.toRadians(x);
        y = Math.toRadians(y);

        // print the hyperbolic tangent of these doubles
        System.out.println("Math.tanh(" + x + ")=" + Math.tanh(x));
        System.out.println("Math.tanh(" + y + ")=" + Math.tanh(y));
    }
}
```

```
}
```

Let us compile and run the above program, this will produce the following result:

```
Math.tanh(0.7853981633974483)=0.6557942026326724  
Math.tanh(-3.141592653589793)=-0.99627207622075
```

```
Loading [MathJax]/jax/output/HTML-CSS/jax.js
```