25. JavaScript Math Object

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25.1. Math Object

The Math object allows you to perform mathematical tasks.

The Math object includes several mathematical constants and methods.

Syntax for using properties/methods of Math:

```
var x=Math.PI;
var y=Math.sqrt(16);
```

Note: Math is not a constructor. All properties and methods of Math can be called by using Math as an object without creating it.

a) Mathematical Constants

JavaScript provides eight mathematical constants that can be accessed from the Math object. These are: E, PI, square root of 2, square root of 1/2, natural log of 2, natural log of 10, base-2 log of E, and base-10 log of E.

You may reference these constants from your JavaScript like this:

```
Math.E
Math.PI
Math.SQRT2
Math.SQRT1_2
Math.LN2
Math.LN10
Math.LOG2E
Math.LOG10E
```

b) Mathematical Methods

In addition to the mathematical constants that can be accessed from the Math object there are also several methods available.

The following example uses the round() method of the Math object to round a number to the nearest integer:

```
document.write(Math.round(4.7));
```

The code above will result in the following output:

```
5
```

The following example uses the random() method of the Math object to return a random number between 0 and 1:

```
document.write(Math.random());
```

The code above can result in the following output:

```
0.7385544038913526
```

The following example uses the floor() and random() methods of the Math object to return a random number between 0 and 10:

```
document.write(Math.floor(Math.random()*11));
```

The code above can result in the following output:

```
8
```

25.2. Examples

a) Round() . How to use round().

```
<!DOCTYPE html>
<html>
<body>

<p id="demo">Click the button to round the number 2.5 to
its nearest integer.</p>

<button onclick="myFunction()">Try it</button>

<script>
function myFunction()
{
document.getElementById("demo").innerHTML=Math.round(2.5);
}
</script>

</body>
```

```
</html>
```

b) Random() . How to use random() to return a random number between 0 and 1.

```
<!DOCTYPE html>
<html>
<body>

<p id="demo">Click the button to display a random
number.</p>

<button onclick="myFunction()">Try it</button>

<script>
function myFunction()
{
document.getElementById("demo").innerHTML=Math.random();
}
</script>

</body>
</html>
```

c) max() . How to use max() to return the number with the highest value of two specified numbers.

```
<!DOCTYPE html>
<html>
<body>

<p id="demo">Click the button to return the highest number
of 5 and 10.</p>

<button onclick="myFunction()">Try it</button>

<script>
function myFunction()
{
document.getElementById("demo").innerHTML=Math.max(5,10);
}
</script>

</body>
</html>
```

d) Min() . How to use min() to return the number with the lowest value of two specified numbers.

```
<!DOCTYPE html>
<html>
<body>

<p id="demo">Click the button to return the lowest number
of 5 and 10.</p>

<button onclick="myFunction()">Try it</button>

<script>
function myFunction()
{
document.getElementById("demo").innerHTML=Math.min(5,10);
}
</script>

</body>
</html>
```

25.3. Complete Math Object Reference

For a complete reference of all the properties and methods that can be used with the Math object, go to our complete Math object reference. The reference contains a brief description and examples of use for each property and method!

Math Object Properties

Property	Description
E	Returns Euler's number (approx. 2.718)
LN2	Returns the natural logarithm of 2 (approx. 0.693)
LN10	Returns the natural logarithm of 10 (approx. 2.302)
LOG2E	Returns the base-2 logarithm of E (approx. 1.442)
LOG10E	Returns the base-10 logarithm of E (approx. 0.434)
PI	Returns PI (approx. 3.14)

SQRT1_2	Returns the square root of 1/2 (approx. 0.707)
SQRT2	Returns the square root of 2 (approx. 1.414)

Math Object Methods

Method	Description
abs(x)	Returns the absolute value of x
acos(x)	Returns the arccosine of x, in radians
asin(x)	Returns the arcsine of x, in radians
atan(x)	Returns the arctangent of x as a numeric value between -PI/2 and PI/2 radians
atan2(y,x)	Returns the arctangent of the quotient of its arguments
ceil(x)	Returns x, rounded upwards to the nearest integer
cos(x)	Returns the cosine of x (x is in radians)
exp(x)	Returns the value of E^x
floor(x)	Returns x, rounded downwards to the nearest integer
log(x)	Returns the natural logarithm (base E) of x
max(x,y,z,...,n)	Returns the number with the highest value
min(x,y,z,...,n)	Returns the number with the lowest value
pow(x,y)	Returns the value of x to the power of y
random()	Returns a random number between 0 and 1
round(x)	Rounds x to the nearest integer
sin(x)	Returns the sine of x (x is in radians)
sqrt(x)	Returns the square root of x
tan(x)	Returns the tangent of an angle