

Mathematical functions in Java Script

- 1) Mathematical functions & values are part of JavaScript Objects called as "Math"
- 2) All functions & attributes used in Mathematical Complex data must be accessed through this object.
- 3) This is done by preceding the function name with object name.

The Math functions are Categorized as following

(I) Not-a-Number (NaN) :-

This is a Value which represents something which is not a number.

Ex:- Var a = 10;

Var b = 20;

Var c = Aditya;

b/a;

a/c;

(II) Math.abs() :- Return the absolute (positive) no value of x.

Synt Math.abs(x);

Ex- Math.abs(10);

Math.abs(10.5);

Math.abs(-10.5);

O/p:- 10

10.5

10.5

(III) Math.round:- Returns the Value of x rounded to its nearest value.

Synt:- $\text{math.round}(x)$

Ex:- $\text{Math.round}(4.7)$

$\text{Math.round}(5.8)$

O/p:-
5
5

(IV) Math.pow():- Returns the Values of x, to the power.

Synt $\text{Math.pow}(x, y);$

Ex:- $\text{Math.pow}(8, 2);$

$\text{math.pow}(5, 2);$

(V) Math.Sqrt():- Returns the Square root of the given values

Synt $\text{Math.Sqrt}(x)$

Ex:- $\text{math.Sqrt}(64);$

(VI) Math.Ceil():- Returns the Value of x rounded upto its nearest integer.

Synt:- $\text{math.Ceil}(x)$

Ex:- $\text{Math.Ceil}(4.9)$

O/p:- 4

(VII) Math.Sin(x):- Returns Sin Value of a number

Synt $\text{Math.Sin}(x)$

Ex:- $\text{Math.Sin}(30);$

O/p:- 1

(vii) Math·cos():- It returns cos Value of a number
math·cos(x)

Eg: Math·cos(45)

O/p: $\frac{1}{\sqrt{2}}$.

(ix) Math·tan():- It returns tan Value of a number

Synt math·tan(x)

Ex: Math·tan(45)

Similarly: Math·Sec();

Math·Cosec();

Math·Cot();

(x) Math·max():- It is used to find the highest Value in the list of arguments

Synt: Math·max(10, 20, 100, 50, 60);

O/p: 100.

(xi) Math·min():- It is used to find the least Values in the list of given arguments

Ex: Math·min(10, 20, 100, 50, 60)

O/p: 10.

(xii) Math·Exp():- It returns the exponential Value of a given number i.e; e^x

Ex:- Math·Exp(2)

O/p:- e².

/* Program for Mathematical Function in JavaScript

<html>

<body>.

<Script type = "JavaScript">

document . writeln (Math . abs (- 7.5)) ; // 7.5

" " ("
");

" " (Math . abs (" hello ")) ; Nan.

" " ("
");

" " ((cos 0) ,] (sin 90)

" " ("
");] (tan 90)
(cot 90).

" " (math . round (4.7)) ; // 5

" " ("
");

" " (math . sqrt (64)) ;

" " ("
");

" " (math . max (10, 20, 40, 100, 80)) ;

" " ("
");

" " (math . min (10, 20, 40, 100, 80)) ;

" " ("
");

Function:-

Functions are ^{defined} made by using the function keyword followed by function name.

Syntax:-

```
functions function-name (Parameter1, Parameter2)
{
    body,
}
```

Function Call:-

Function called using the function name followed the list of parameters separated by comma & ends with a semi-colon.

Syntax:-

```
function call
function-name (Parameter1, Parameter2....)
```

Eg:-

```
<html>
```

```
<body>
```

```
<Script>
```

```
Var a=10, b=20, C=30;
```

```
document.write ("<h1>") Biggest of 3 numbers is  
"maximum"</h1>;
```

function maximum (x, y, z)

{ if ($x > y$) && ($x > z$)

return x;

else if ($y > z$)

return y;

else

return z;

</html>

</body>

</script>

* Built-in functions:

Function	Description.
1. alert()	1. Display the alert dialogue box.
2. confirm()	2. Displays the confirmation dialogue box and asks the user to determine from the options.
3. focus()	3. Function build the pointed object active and put the cursor on the text field.
4. prompt()	4. Displays the prompt dialogue box enquiring the user for input.
5. select()	5. It is used to select the pointed objects.
6. write()	6. Used to write something on the document.

* Hello

7.

* Recursion:-

A recursion function is a function that calls itself either directly (or) indirectly through another function.

* Program to find factorial of a given number

```
<html>
```

```
<head>
```

```
<script>
```

```
function fact(n)
```

```
{ if (n==1)
```

```
    return n;
```

```
    return n * fact(n-1);
```

```
}
```

```
</script>
```

```
</head>
```

```
<html> <body>
```

```
<script>
```

```
var n = prompt("Enter any number", "0");
```

```
document.write(fact(n));
```

```
</script>
```

```
</body>
```

```
</html>
```

- * Objects in Java Script:-
 - Objects:- An object is an collection of related properties and methods. Properties represent's features and method represent's action that may be performed on those objects. This properties may be primitive datatype (or) maybe object themselves. Properties and methods can be added at any time even after the creation of any object. Objects of same class may have different set of properties and methods.

- Properties are the values associated with an Object.
- Methods; are the action that can be performed on Objects.
- New: This keyword is used to create objects. It allows memory and storage for them and sets all variables that can be used. A class in Java Script is defined by a function.

which act as the constructor for the class.
Objects are created with the help of this
constructor function and the "new" operator.

→ this:

This is used to differentiate b/w global variables and those which are part of an object but may have the same name. When ever we refer to a variable which is a part of an object then we must precede the variable name by this.

→ dot (.):

To refer to a property of an object whether a method or variable, a dot is placed b/w the object name and the property.

* Built-in Objects in Java Script:-

1. The document object:-

A document is a web page that is being either displayed or created. The document has a number of properties that can be accessed by Java Script program and used to manipulate the content of the page.

Some of the properties are:

1. write() (or) writeln():

This one used to display messages,
(or) to create html page.

2. Bg color | ^{fore} fg color();

This is used to set background
(color), (or) foreground color.

3. anchor():

Anchors are created using

{a name = >

4. form():

This is an array's in the object of the
document. This contains all the html forms. By
Combining this array with the individual form
Objects, each form Objects can be accessed.

5. layers():

A document can be made from a no. of
layers of contents. This array contains the layer
Objects. Layer have many methods and properties
- one of there Out.

6. close():

This property is used to close the current window.

7. title

2. Window object:

Some of the properties and methods that are available in window objects are:

1. Open():

Syntax:-

'Open ("url", "name")'

This will open a new window which contains the document specified by "URL".

This

2. Close():

This will close the current window.

Syntax:-

'close ()'

3. width / height (in pixel):

This properties are used to set the window size and image size.

4. scroll (coordinate x, coordinate y)

This is used for the contents of the windows which can scroll by using method.

3. Form object:

The form objects can be manipulated through Java Script.

The data is entered into the form, which can be checked at the time of submission. The form objects represents by using html for each form tag in an html document a form object is created.

→ Forms are used to collect user input and contains input elements like text fields, check boxes, radio buttons, submit buttons etc. A form also contains select menu's, text area, field set, label elements etc. These forms are used to pass data to the server.

1. On Click()

This can be applied on form elements. The event is triggered when the user click on that element. `On click = "method"`

2. On Submit()

(This event occurs when the submit button in a form is clicked.)

On Submit = "method"

3. On Reset :-

This event occurs when the reset button in a form is clicked.

On Reset = "method"

4. The Browser Objects :- (or) The Navigator object

1. appCodeName :-

This returns the code name of the browser.

2. appName :-

This displays the name of the browser.

3. appVersion :-

It returns the browser version information of the browser.

4. Plug in :-

It returns the details containing of all installed plug-in.

5. Date objects:-

This object is used to work with date and time and date objects are created with new date function.

1. get date():-

get date, it returns date of the month in the range (01-31)

2. get Day():-

It returns day of the week.

3. get full year():-

It returns the year in four digits.

4. get hours():-

It returns hours in (0-23).

5. get minutes():-

It returns minutes in (0-59).

6. get seconds():-

It returns Seconds in (0-59)

7. get month():-

It returns month in (Jan-dec) (1-12)

* Data & Time Object Program:-

```
<html>
<body>
<script>
d = new Date();
Weeks = ["Sunday", "Monday", "Tuesday", ...];
document.write("<br>" + data);
document.write("<br>" + year);
document.write("<br>" + day);
document.write("<br>" + hours);
document.write("<br>" + minutes);
document.write("<br>" + "Second");
</script>
</body>
</html>
```

* Browser Sniffing:-

It is a technique used in websites and web applications in order to determine the web browser visited is using and to serve visitor appropriate content.

Browser appropriate to the visitor.

for example: it can detect which type of browser and which version of the software client computer is running.

* Java Script Regular Expressions:

A Regular Expression is an object that describes the pattern of characters perform powerful pattern matching, and search and replace function on text.

Regular Expressions are manipulated using functions which belong to either regular expression or string class.

→ Patterns:

Search pattern can be very simple or complicated. Patterns are expressed in cryptic but powerful symbols which are used to replace complex statements.

→ Functions:

Regular Expression are manipulated using function which belong to either regular expression or string classes

The class string functions are

- (i) match (pattern)
- (ii) replace (Pattern, Pattern 2)

- (iii) search (Pattern)

The class Regular function are

- (i) exec (String)

- (ii) test (String)

{***}

* Flags:-

A Flag Variable is a Variable we define to have one value, until some condition is true by which we can change the Variable Value at any time. We can use to control the flow of a function (or) statement allowing to check for certain conditions while the function is in progress.

Program for flags:-

<html>

<body>

<script>

```
int a = [1, 2, 3, 4, 5, 6, 7, 8];  
int b = 4;  
boolean flag = false;  
if (b == a)  
    flag = true;  
    break;  
if (flag == True)  
{  
    print ("found")  
}  
else
```

* Exceptional handling in JavaScript
Exceptional handling in JavaScript is a process of handling abnormal statements that occurs during the execution of a program. There three main types of errors that can occur compiling a java script program that is

1. Syntax Error
2. Runtime Error
3. Logical Error.

The most common type of errors are Syntax errors, in which something incorrect of the program then this errors occurs.

Java Script allows to work with three primitive data types i.e, numbers, strings, booleans. There are try and catch statement which has try block and a catch block, finally block. The code in the code try block is executed first and if it throws an exception the code in the catch block will be executed.

Syntax:- with program

```
<html>
<body>
<script>
```

Exceptional handling in Java Script

```
try
```

```
{
```

The main code runs
break;

catch (RecognitionException e) {
 System.out.println("Caught RecognitionException.
(exception.e) " + e);
}

The code runs here

breaks at finally block and
gives error at caught exception null.
This is because finally block is executed
in both situations and either exception
or no exception will result in finally
block. So if exception is thrown, just
before finally block is reached, it is
executed. But when finally block is not
reached, then finally block is not

executed. So finally block is not
executed when exception is thrown
and vice versa.

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