

JavaScript Functions and Events

Module 4 - Math Built-in Functions in JavaScript



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What are Built-in Functions in JavaScript?

Built-in functions are pre-defined functions provided by JavaScript that perform specific tasks. These functions are part of the JavaScript standard library, making it easier for developers to carry out common operations without having to write complex code.

Key Characteristics of Built-in Functions:

- Pre-defined: Built-in functions are already available in JavaScript and can be used directly.
- Reusable: You can call them multiple times in your code.
- Versatile: They cover a wide range of functionalities like string manipulation, mathematical calculations, data parsing, etc.
- Easy to Use: They save time and effort since you don't have to define these functionalities from scratch.

Examples of Built-in Functions in JavaScript:

- General Functions: alert(), prompt(), console.log(), parseInt(), isNaN().
- Math Functions: Math.abs(), Math.sqrt(), Math.round().
- String Functions: toUpperCase(), toLowerCase(), substring().

Examples of Built-in Math Functions:

1. Absolute Value: Math.abs(x)

Returns the absolute (non-negative) value of x.
Example: Math.abs(-5) → 5.

Example:

```
<!DOCTYPE html>
<html>
<head>
  <title>Math.abs() Example</title>
  <script>
    let number = -42;
    let absValue = Math.abs(number);
    document.write("The absolute value of " + number + " is: " + absValue);
  </script>
</head>
<body bgcolor="#f0f8ff">
```



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

OUTPUT:

The absolute value of -42 is: 42

2. Power: Math.pow(base, exponent)

Returns the value of base raised to the power of exponent.

Example: Math.pow(2, 3) → 8.

Example:

```
<!DOCTYPE html>
<html>
<head>
  <title>Math.pow() Example</title>
  <script>
    let base = 2;
    let exponent = 3;
    let result = Math.pow(base, exponent);
    document.write(base + " raised to the power of " + exponent + " is: " +
result);
  </script>
</head>
<body bgcolor="#f0f8ff">
</body>
</html>
```

OUTPUT:

2 raised to the power of 3 is: 8

3. Square Root: Math.sqrt(x)

Returns the square root of x.

Example: Math.sqrt(16) → 4.

Example:

```
<!DOCTYPE html>
<html>
<head>
  <title>Math.sqrt() Example</title>
  <script>
    let number = 25;
```

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```
let sqrtValue = Math.sqrt(number);
document.write("The square root of " + number + " is: " + sqrtValue);
</script>
</head>
<body bgcolor="#f0f8ff">
</body>
</html>
```

OUTPUT:
The square root of 25 is: 5

4. Maximum and Minimum: Math.max() and Math.min()
Find the largest or smallest value in a list of numbers.
Example: Math.max(3, 7, 2) → 7.

Example:

```
<!DOCTYPE html>
<html>
<head>
<title>Math.max() Example</title>
<script>
let maxValue = Math.max(10, 20, 5, 8);
document.write("The maximum value among (10, 20, 5, 8) is: " + maxValue);
</script>
</head>
<body bgcolor="#f0f8ff">
</body>
</html>
```

OUTPUT:
The maximum value among (10, 20, 5, 8) is: 20

Example:

```
<!DOCTYPE html>
<html>
<head>
<title>Math.min() Example</title>
<script>
let minValue = Math.min(10, 20, 5, 8);
document.write("The minimum value among (10, 20, 5, 8) is: " + minValue);
</script>
```

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```
</head>  
<body bgcolor="#f0f8ff">  
</body>  
</html>
```

OUTPUT:

The minimum value among (10, 20, 5, 8) is: 5

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5. Random Number: Math.random()

Generates a random number between 0 (inclusive) and 1 (exclusive).

Example: Math.random() → 0.73482.

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Example:

```
<!DOCTYPE html>  
<html>  
<head>  
  <title>Math.random() Example</title>  
  <script>  
    let randomValue = Math.random();  
    document.write("A random number between 0 and 1 is: " + randomValue);  
  </script>  
</head>  
<body bgcolor="#f0f8ff">  
</body>  
</html>
```

OUTPUT:

A random number between 0 and 1 is: 0.837462 (example)

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6. Rounding:

Math.round(x) → Rounds x to the nearest integer.

Math.ceil(x) → Rounds x up to the nearest integer.

Math.floor(x) → Rounds x down to the nearest integer.

Example:

```
<!DOCTYPE html>  
<html>  
<head>
```

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```
<title>Math.round() Example</title>
<script>
  let number = 4.7;
  let roundedValue = Math.round(number);
  document.write(number + " rounded to the nearest integer is: " +
roundedValue);
</script>
</head>
<body bgcolor="#f0f8ff">
</body>
</html>
```

OUTPUT:
4.7 rounded to the nearest integer is: 5

Example:

```
<!DOCTYPE html>
<html>
<head>
  <title>Math.ceil() Example</title>
  <script>
    let number = 4.2;
    let ceilValue = Math.ceil(number);
    document.write(number + " rounded up is: " + ceilValue);
  </script>
</head>
<body bgcolor="#f0f8ff">
</body>
</html>
```

OUTPUT:
4.2 rounded up is: 5

Example:

```
<!DOCTYPE html>
<html>
<head>
  <title>Math.floor() Example</title>
  <script>
    let number = 4.9;
    let floorValue = Math.floor(number);
    document.write(number + " rounded down is: " + floorValue);
  </script>
</head>
<body bgcolor="#f0f8ff">
</body>
</html>
```

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```
</script>  
</head>  
<body bgcolor="#f0f8ff">  
</body>  
</html>
```

OUTPUT:
4.9 rounded down is: 4

Assignment

Ques 1: Create a function calculateCircleArea(radius) that calculates and returns the area of a circle. Use the formula $Area = Math.PI * Math.pow(radius, 2)$.

Ques 2: Write a Program to calculate the power of a number.

- Base = 6, Exponent = 3
- Base = 3, Exponent = 6
- Base = 5, Exponent = 5

Ques 3: Write a Program to find the square root of a number

- Number = 25
- Number = 100
- Number = 1156
- Number = 6084
- Number = 4356

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