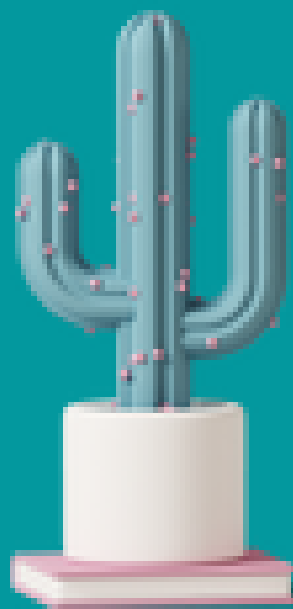


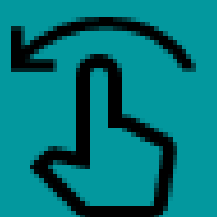
9

JavaScript Math

Operations that You must know



Gaurav Pandey



The Math.PI

```

// Printing PI value
document.write(Math.PI); // Prints: 3.141592653589793

// Function to calculate circle area
function calculateCircleArea(radius){
    var area = (Math.PI) * radius * radius;
    return area;
}

document.write(calculateCircleArea(5));
// Prints: 78.53981633974483
document.write(calculateCircleArea(10));
// Prints: 314.1592653589793

```

The Math.PI property represents the ratio of the circumference of a circle to its diameter. PI (π) is a mathematical constant, which is approximately 3.14159:
 $\text{Math.PI} = \pi \approx 3.14159$



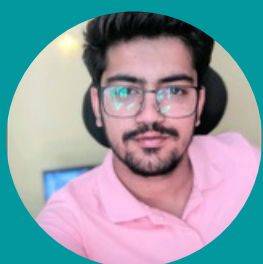
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Math.random()

```
document.write(Math.random());  
    // Expected output: a number between 0 and 1  
  
// Function to create random integer  
function getRandomInt(max) {  
    return Math.floor(Math.random() * max);  
}  
  
document.write(getRandomInt(3));  
    // Expected output: 0, 1 or 2  
document.write(getRandomInt(1));  
    // Expected output: 0
```

The `Math.random()` method is used to generate a floating-point random number in the range from 0 inclusive up to but not including 1. However, if you want a random integer between zero and an integer higher than one



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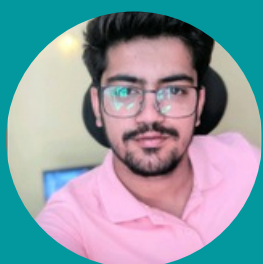


Math.abs()



```
document.write(Math.abs(-1)); // Prints: 1  
document.write(Math.abs(1)); // Prints: 1  
document.write(Math.abs(-5)); // Prints: 5  
document.write(Math.abs(-10.5)); // Prints: 10.5
```

The `Math.abs()` method is used to calculate the absolute (positive) value of a number. Therefore, `-1` is returned as `1`, `-5` as `5`, and so on.



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Math.sqrt()

```
document.write(Math.sqrt(4)); // Prints: 2
document.write(Math.sqrt(16)); // Prints: 4
document.write(Math.sqrt(0.25)); // Prints: 0.5
document.write(Math.sqrt(-9)); // Prints: NaN

/* Function to calculate hypotenuse.
Hypotenuse is the longest side of a right-angled triangle.*/
function calculateHypotenuse(a, b) {
    return Math.sqrt((a * a) + (b * b));
}

document.write(calculateHypotenuse(3, 4)); // Prints: 5
document.write(calculateHypotenuse(5, 12)); // Prints: 13
```

The `Math.sqrt()` method is used to calculate the square root of a number: $\text{Math.sqrt}(x) = x$

If the number is negative, NaN is returned



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Math.ceil()



```
document.write(Math.ceil(3.5)); // Prints: 4
document.write(Math.ceil(-5.7)); // Prints: -5
document.write(Math.ceil(9.99)); // Prints: 10
document.write(Math.ceil(-9.99)); // Prints: -9
document.write(Math.ceil(0)); // Prints: 0
```

`Math.ceil()` method rounds a number up to the next highest integer. So, 3.5 becomes 4, -5.7 becomes -5 (because -5 is greater than -6).



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Math.floor()



```
document.write(Math.floor(3.5)); // Prints: 3  
document.write(Math.floor(-5.7)); // Prints: -6  
document.write(Math.floor(9.99)); // Prints: 9  
document.write(Math.floor(-9.99)); // Prints: -10  
document.write(Math.floor(0)); // Prints: 0
```

`Math.floor()` method rounds a number down to the next lowest integer. So, 3.5 becomes 3, -5.7 becomes -6 (because -6 is lesser than -5).



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Math.round()



```
document.write(Math.round(3.5)); // Prints: 4
document.write(Math.round(-5.7)); // Prints: -6
document.write(Math.round(7.25)); // Prints: 7
document.write(Math.round(4.49)); // Prints: 4
document.write(Math.round(0)); // Prints: 0
```

`Math.round()` method rounds a number to the nearest integer in such a way that if the decimal part is .5 or greater, number is rounded up, otherwise rounded down. So, 3.5 becomes 4, -5.7 becomes -6, 4.49 becomes 4, and so on.



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Math.max() and Math.min()



```
document.write(Math.max(1, 3, 2)); // Prints: 3  
document.write(Math.max(-1, -3, -2)); // Prints: -1  
  
document.write(Math.min(1, 3, 2)); // Prints: 1  
document.write(Math.min(-1, -3, -2)); // Prints: -3
```

Math.max() and Math.min() methods are used to find which number is the largest or smallest in a group of numbers, respectively.



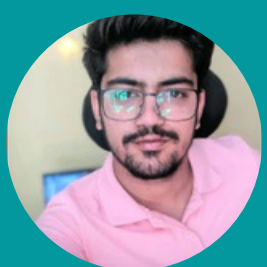
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Math.pow()



```
document.write(Math.pow(3, 2)); // Prints: 9  
document.write(Math.pow(0, 1)); // Prints: 0  
document.write(Math.pow(5, -2)); // Prints: 0.04  
document.write(Math.pow(8, 1/3)); // Prints: 2 (cube root of 8)
```

`Math.pow()` method is used to raise a number to a specified power.



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