Lesson:

Math

PW SKILLS

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Introduction to math object

The Math object in JavaScript is a built-in object that provides a set of mathematical operations and functions. It is not a constructor like other objects, so you don't need to create an instance of it. You can directly use its properties and methods to perform various mathematical calculations.

To access the Math object, simply use the Math keyword followed by a dot and the specific method or property you want to use.

1) .abs()

The **.abs()** method returns the absolute value of a number. It gives you the positive value of a number, regardless of its sign. For example:

code example:

```javascript
let num = -5;
let absValue = Math.abs(num); // absValue will be 5
```

2) .ceil()

The **.ceil()** method rounds a number up to the nearest whole number (integer), no matter how small the decimal part is. For example:

code example:

```javascript
let num = -5;
let absValue = Math.abs(num); // absValue will be 5
```

3) .floor()

The **.floor()** method rounds a number down to the nearest whole number (integer), even if the decimal part is close to the next whole number. For example:

code example:

```javascript
let num = 7.75;
let floorValue = Math.floor(num); // floorValue will be 7
```

4) .round()

The **.round()** method rounds a number to the nearest whole number, using standard rounding rules. If the decimal part is 0.5 or higher, it rounds up; otherwise, it rounds down.

code example:

```javascript
const num1 = 7.4;
const num2 = 7.6;
const roundValue1 = Math.round(num1); // roundValue1 will be 7
const roundValue2 = Math.round(num2); // roundValue2 will be 8
```

5) .max()

The **.max()** method returns the largest value from a set of numbers. You can provide multiple arguments to the method, and it will find the maximum value among them. For example:

code example:

```javascript
const maxVal = Math.max(10, 5, 20, 8); // maxVal will be 20
```

6) .min()

The **.min()** method returns the smallest value from a set of numbers. Like .max(), you can provide multiple arguments to the method. For example:

code example:

```javascript
let minVal = Math.min(10, 5, 20, 8); // minVal will be 5
```

7) .pow()

The **.pow()** method is used to raise a number to a specific power. It takes two arguments: the base number and the exponent. It returns the result of the base raised to the power of the exponent. For example:

code example:

```javascript
let base = 2;
let exponent = 3;
let result = Math.pow(base, exponent); // result will be 8 (2^3)
```

8) .sqrt()

The **.sqrt()** method calculates the square root of a given number. It returns the positive square root value. For example:

code example:

```javascript
let num = 16;
let sqrtValue = Math.sqrt(num); // sqrtValue will be 4
```

9) .random()

The **.random()** method generates a random decimal number between 0 (inclusive) and 1 (exclusive). This can be used as a basis for generating random numbers within a specific range. For example:

code example:

```javascript
const randomValue = Math.random(); // randomValue will be a
random decimal between 0 and 1
```

10) .PI

It represents the mathematical constant Pi, which is the ratio of the circumference of a circle to its diameter. Pi is an irrational number and is approximately equal to 3.141592653589793.

```
JavaScript
const piValue = Math.PI;
console.log(piValue); // This will output approximately
3.141592653589793
```

11) .sin()

The **Math.sin()** method is used to calculate the sine of an angle, where the angle is specified in radians.

code example:

```
JavaScript
const angleInRadians = Math.PI / 6; // Angle of 30 degrees in
radians
const sineValue = Math.sin(angleInRadians);
console.log("The sine of 30 degrees is: " + sineValue);
// output :The sine of 30 degrees is: 0.5
```

12) .cos()

The **Math.cos()** method is used to calculate the cosine of an angle in radians.

code example:

```
JavaScript
const angleInRadians = Math.PI / 3; // Angle of 60 degrees in
radians
const cosineValue = Math.cos(angleInRadians);
console.log("The cosine of 60 degrees is: " + cosineValue);

// output :The cosine of 60 degrees is: 0.5
```

13) .tan()

The **Math.tan()** method is used to calculate the tangent of an angle in radians.

code example:

```javascript
const angleInRadians = Math.PI / 4; // Angle of 45 degrees in
radians
const tangentValue = Math.tan(angleInRadians);
console.log("The tangent of 45 degrees is: " + tangentValue);

// Output : The tangent of 45 degrees is: 1
```

14) .log()

The **Math.log()** method is used to calculate the natural logarithm of a number.

code example:

```javascript
const number = 10;
const naturalLog = Math.log(number);
console.log("The natural logarithm of 10 is: " + naturalLog);

//output : The natural logarithm of 10 is: 2.302585092994046
```

15) .exp()

The **Math.exp()** method is used to calculate the exponential value of a number (e^x, where 'x' is the input).

code example:

```javascript
const number = 2;
const exponentialValue = Math.exp(number);
console.log("e raised to the power of 2 is: " +
exponentialValue);

// Output : e raised to the power of 2 is: 7.3890560989306495
```