

Expressions and Operators

- **Arithmetic Operators**

1. addition (+)
2. subtraction (-)
3. multiplication (*)
4. division (/)
5. remainder (%)
6. exponentiation (**) to square root use " ** 1/2 "
7. increment (++)
8. decrement (--)

- **Assignment (Atribuição)**

1. num1 = num1 + 2
2. num1 += 2
3. num1 -= 2
4. num1 *= 2
5. num1 /= 2
6. num1 &= 2
7. num1 **= 2

```
let num1 = 3
```

```
let num2 = 2
```

```
console.log(num1 + num2)
```

```
console.log(num1 - num2)
```

```
console.log(num1 * num2)
```

```
console.log(num1 / num2)
```

```
console.log(num1 % num2)
```

```
console.log(num1 ** num2)
```

```
console.log(--num1)
```

```
console.log(++num1 + num2)
```

- **Comparison Operators (Boolean)**

1. > >=
2. < <=
3. == !=
4. === !==

Ex:

```
console.log(num1 > num2)
console.log(num1 <= num2)
console.log(num1 == num2)
console.log(num1 !== num2)
```

- **Logical Operators (Boolean)**

1. and (&&)
2. or (||)
3. not (!)

Ex: Ir para a Walt Disney?

```
let creditCard = true;
let hasCredit = true;

console.log(!creditCard);

console.log(creditCard && hasCredit);

let saveMoney = true;
let getLoan = true;

console.log(saveMoney || getLoan);
```

TRUTH TABLE

Conjunction, Disjunction

P	Q	$P \wedge Q$	$P \vee Q$
V	V	V	V
V	F	F	V
F	V	F	V
F	F	F	F

Negation

P	Q	$\sim P$	$\sim Q$
V	V	F	F
V	F	F	V
F	V	V	F
F	F	V	V

Exercise

P	Q	$\sim P \wedge Q$	$P \wedge \sim Q$
V	V		
V	F		
F	V		
F	F		

P	Q	$\sim P \vee Q$	$\sim(P \vee \sim Q)$
V	V		
V	F		
F	V		
F	F		

P	Q	$P \vee (Q \wedge P)$	$(P \wedge Q) \vee \sim Q$
V	V		
V	F		
F	V		
F	F		

- **Operators**

1. Binary

```
let n1 = 8
let n2 = 7

console.log(n1 + n2)
console.log("Test " + n2)
```

2. Unary

```
console.log(n1++)
console.log(n1)
console.log(++n1)
console.log(typeof n2)

const fruits = ['banana', 'maçã', 'Uva']
delete fruits[1]
console.log(fruits)
```

3. Ternary

test ? true : false

```
let avarege = 7
console.log(avarege >= 7 ? 'Aprovado': 'Reprovado')
```

- **Truthy e False**

* Cuidado com valores onde o booleano é considerado obrigatório (condicionais e loops)

Truthy	False
1, 1.5, -1	0
" ", "0", "false"	""
{ }	null
[]	undefined
Infinity, -Infinity	NaN

```
console.log( 1 ? 'yes' : 'no')  
console.log( "" ? 'yes' : 'no')  
console.log( "0" ? 'yes' : 'no')  
console.log( {} ? 'yes' : 'no')  
console.log( null ? 'yes' : 'no')  
console.log( Infinity ? 'yes' : 'no')
```

- **Expressions Grouping Operator**

```
let total = (2 + 3) * 3  
console.log(total)
```

- **Operator Precedence**

Grouping	()
Negation, Increment and Decrement	! ++ --
Exponentiation	**
Multiplication and Division	* /
Addition and Subtraction	+ -
Comparison	< <= > >=
Equality	== != === !==
And	&&
Or	
Conditional	? :
Assignment	= += -= *= %=

```
console.log(7 + 8 / 2)
console.log((7 + 8) / 2)
console.log(3 > 2 && 4 < 10)
console.log(3 < 2 || 4 < 10)
console.log(6 < 2 || 4 > 10)
console.log(3 > 2 > 1) // true == 1 false == 0
console.log(3 > 2 && 2 > 1)
console.log(true == 1)
console.log(true === 1)
```

Referência: https://developer.mozilla.org/pt-BR/docs/Web/JavaScript/Guide/Expressions_and_Operators