**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 economizarDinheiro = true

        let juntarDinheiro = true

        console.log(economizarDinheiro && juntarDinheiro)

        let guardarPoupanca = false

        let pegarEmprestimo = true

        console.log(guardarPoupanca || pegarEmprestimo)

console.log(!guardarPoupanca)

**TRUTH TABLE**

**Conjunction, Disjunction**

|  |  |  |  |
| --- | --- | --- | --- |
| **P** | **Q** | **P ^ Q** | **P v Q** |
| **V** | **V** |  |  |
| **V** | **F** |  |  |
| **F** | **V** |  |  |
| **F** | **F** |  |  |
|  |  | **Negation** |  |
| **P** | **Q** | **~P** | **~Q** |
| **V** | **V** |  |  |
| **V** | **F** |  |  |
| **F** | **V** |  |  |
| **F** | **F** |  |  |
|  |  | **Exercise** |  |
| **P** | **Q** | **~P ^ Q** | **P ^ ~Q** |
| **V** | **V** |  |  |
| **V** | **F** |  |  |
| **F** | **V** |  |  |
| **F** | **F** |  |  |
|  |  |  |  |
| **P** | **Q** | **~P v Q** | **~(P v ~Q)** |
| **V** | **V** |  |  |
| **V** | **F** |  |  |
| **F** | **V** |  |  |
| **F** | **F** |  |  |
|  |  |  |  |
| **P** | **Q** | **P ^ (Q ^ P)** | **(P ^ Q) v ~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)

1. 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)

1. 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 | ! ++ -- |
| 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/JavaScri>