

# Operators in TypeScript

## 1) Arithmetic Operators

These operators perform basic mathematical operations.

- `+` (Addition): Adds two numbers  $\rightarrow 10 + 5 = 15$
- `-` (Subtraction): Subtracts one number from another  $\rightarrow 10 - 5 = 5$
- `*` (Multiplication): Multiplies two numbers  $\rightarrow 10 * 5 = 50$
- `/` (Division): Divides one number by another  $\rightarrow 10 / 5 = 2$
- `%` (Modulus): Returns the remainder of division  $\rightarrow 10 \% 3 = 1$
- `**` (Exponentiation): Raises a number to a power  $\rightarrow 2 ** 3 = 8$

## 2) Assignment Operators

Used to assign values to variables.

- `+=`  $\rightarrow x += 5$  (same as `x = x + 5`)
- `-=`  $\rightarrow x -= 5$  (same as `x = x - 5`)
- `*=`  $\rightarrow x *= 5$  (same as `x = x * 5`)
- `/=`  $\rightarrow x /= 5$  (same as `x = x / 5`)
- `%=`  $\rightarrow x \% = 5$  (same as `x = x \% 5`)

## 3) Increment & Decrement Operators

Used to increase or decrease a value by 1.

- `++` (Increment)
  - `x++` (Post-increment: First use the value, then increase it)
  - `++x` (Pre-increment: First increase, then use the value)
- `--` (Decrement)
  - `y--` (Post-decrement: First use the value, then decrease it)
  - `--y` (Pre-decrement: First decrease, then use the value)

## 4) Relational/Comparison Operators

Used to compare values and return true or false.

- `<` (Less than)  $\rightarrow 10 < 20 \rightarrow \text{true}$

- > (Greater than) → 10 > 20 → false
- <= (Less than or equal to) → 10 <= 10 → true
- >= (Greater than or equal to) → 20 >= 15 → true
- == (Equality check, only compares value) → 10 == "10" → true
- != (Not equal) → 10 != 20 → true
- === (Strict equality, compares both value and type) → 10 === "10" → false
- !== (Strict inequality) → 10 !== "10" → true

## 5) Logical Operators

Used to combine multiple conditions.

- && (AND) → Returns true if **both** conditions are true
  - Example: (x > 5 && x < 15) → true only if x is between 5 and 15
- || (OR) → Returns true if **at least one** condition is true
  - Example: (x > 10 || y < 5) → true if any condition is true
- ! (NOT) → Reverses the condition (true → false, false → true)
  - Example: !(x > 5) → If x > 5 is true, ! makes it false

## 6) Ternary Operator (Conditional Operator)

A shortcut for if-else.

- **Syntax:**

```
condition ? value_if_true : value_if_false;
```

- **Example:**

```
let age = 18;
let result = age >= 18 ? "Adult" : "Minor";
console.log(result); // "Adult"
```

If age is 18 or more, it prints "Adult", otherwise "Minor".