

# Operators in TypeScript

## 1) Arithmetic Operators

These operators perform basic mathematical operations.

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

## 2) Assignment Operators

Used to assign values to variables.

- `+=` →  $x += 5$  (same as  $x = x + 5$ )
- `-=` →  $x -= 5$  (same as  $x = x - 5$ )
- `*=` →  $x *= 5$  (same as  $x = x * 5$ )
- `/=` →  $x /= 5$  (same as  $x = x / 5$ )
- `%=` →  $x %= 5$  (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) →  $10 < 20 \rightarrow \text{true}$

- > (Greater than) →  $10 > 20 \rightarrow \text{false}$
- <= (Less than or equal to) →  $10 \leq 10 \rightarrow \text{true}$
- >= (Greater than or equal to) →  $20 \geq 15 \rightarrow \text{true}$
- == (Equality check, only compares value) →  $10 == "10" \rightarrow \text{true}$
- != (Not equal) →  $10 \neq 20 \rightarrow \text{true}$
- === (Strict equality, compares both value and type) →  $10 === "10" \rightarrow \text{false}$
- !== (Strict inequality) →  $10 !== "10" \rightarrow \text{true}$

## 5) Logical Operators

Used to combine multiple conditions.

- && (AND) → Returns true if **both** conditions are true
  - Example:  $(x > 5 \ \&\& \ x < 15) \rightarrow \text{true}$  only if x is between 5 and 15
- || (OR) → Returns true if **at least one** condition is true
  - Example:  $(x > 10 \ \mid\mid \ y < 5) \rightarrow \text{true}$  if any condition is true
- ! (NOT) → Reverses the condition (true → false, false → true)
  - Example:  $!(x > 5) \rightarrow$  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".