

Logical AND (&&) Truth Table

A	B	A && B	Explanation
true	true	true	Both are true → returns true
true	false	false	One is false → returns false
false	true	false	One is false → returns false
false	false	false	Both false → returns false

Logical OR (||) Truth Table

| A | B | A || B | Explanation | | ---- | ---- | ----- | ----- | | true | true | true | First is true → short-circuits | | true | false | true | First is true → short-circuits | | false | true | true | First is false → checks second → true | | false | false | false | Both are false → returns false |

Logical NOT (!) Truth Table

A	!A	Explanation
true	false	Negates true → false
false	true	Negates false → true

 **Note:** These are pure boolean logic values.

In JavaScript, `true`, `false` also include **truthy/falsy** values like:

- Falsy: `false`, `0`, `""`, `null`, `undefined`, `NaN`
- Truthy: everything else (non-empty strings, non-zero numbers, arrays, objects, etc.)

⚡ Short-Circuiting in JavaScript (with Examples)

◆ `&&` (AND) — Stops on Falsy

🔧 Rule:

If the **left side is falsy**, JS short-circuits and returns it. It doesn't even look at the right-hand side.

```
false && console.log("Skipped"); // Output: false
```

JS sees `false`, knows the whole expression is false, and bails.

✅ Examples:

```
0 && "hello"      // → 0
"" && "world"     // → ""
null && 123       // → null
false && true     // → false
```

✅ If Left Is Truthy:

Then JS **evaluates and returns the right side**:

```
true && "Hi"      // → "Hi"
"JS" && 42        // → 42
1 && false       // → false
```

`&&` returns **first falsy** it finds, or the **last value** if all are truthy.

◆ **|| (OR) — Stops on Truthy**

Rule:

If the **left side is truthy**, JS short-circuits and returns it. It doesn't evaluate the right-hand side.

```
true || console.log("Skipped"); // Output: true
```

JS sees `true`, and that's enough — stops right there.

Examples:

```
"hello" || 0 // → "hello"  
true || "fallback" // → true  
1 || false // → 1
```

Real-Life Use Cases

3. **Safe Function Calls**

```
isLoggedIn && showDashboard();
```

Only runs `showDashboard()` if `isLoggedIn` is true.
