

# Operators

## 1. Arithmetic Operators

Arithmetic operators perform mathematical operations on numbers.

```
a, b = 10, 3
print(f"a = {a}, b = {b}")
print(f"Addition: a + b = {a + b}")
print(f"Subtraction: a - b = {a - b}")
print(f"Multiplication: a * b = {a * b}")
print(f"Division: a / b = {a / b}")
print(f"Floor division: a // b = {a // b}")
print(f"Modulo: a % b = {a % b}")
print(f"Power: a ** b = {a ** b}")

a = 10, b = 3
Addition: a + b = 13
Subtraction: a - b = 7
Multiplication: a * b = 30
Division: a / b = 3.333333333333335
Floor division: a // b = 3
Modulo: a % b = 1
Power: a ** b = 1000
```

## 2. Comparison Operators

Comparison operators compare two values and return a boolean result.

```
a, b = 10, 3
print(f"a == b: {a == b}") # Equal to
print(f"a != b: {a != b}") # Not equal to
print(f"a > b: {a > b}") # Greater than
print(f"a < b: {a < b}") # Less than
print(f"a >= b: {a >= b}") # Greater than or equal
print(f"a <= b: {a <= b}") # Less than or equal

a == b: False
a != b: True
a > b: True
a < b: False
a >= b: True
a <= b: False
```

## 3. Logical Operators

Logical operators combine boolean expressions.

```

x, y = True, False
print(f"x = {x}, y = {y}")
print(f"x and y: {x and y}")    # Both must be True
print(f"x or y: {x or y}")      # At least one must be True
print(f"not x: {not x}")        # Inverts the boolean

x = True, y = False
x and y: False
x or y: True
not x: False

```

## 4. Assignment Operators

Assignment operators assign values to variables with optional operations.

```

x = 10
x += 5 # Same as x = x + 5
print(f"After x += 5: {x}")

x *= 2 # Same as x = x * 2
print(f"After x *= 2: {x}")

x /= 3 # Same as x = x // 3
print(f"After x /= 3: {x}")

```

```

After x += 5: 15
After x *= 2: 30
After x /= 3: 10

```

## Key Takeaways

- Arithmetic: +, -, \*, /, //, %, \*\*
- Comparison: ==, !=, >, <, >=, <=
- Logical: and, or, not
- Assignment: =, +=, -=, \*=, /=, %=