



Operator



Relational Operators

- Relational operators always result in a boolean value (true or false).
- There are six relational operators: `>`, `>=`, `<`, `<=`, `==`, and `!=`. The last two (`==` and `!=`) are sometimes referred to as *equality operators*.
- When comparing characters, Java uses the Unicode value of the character as the numerical value.
- Equality operators
 - There are two equality operators: `==` and `!=`.
 - Four types of things can be tested: numbers, characters, booleans, and reference variables.
- When comparing reference variables, `==` returns true only if both references refer to the same object.



instanceof Operator

- instanceof is for reference variables only, and checks for whether the object is of a particular type.
- The instanceof operator can be used only to test objects (or null) against class types that are in the same class hierarchy.
- For interfaces, an object passes the instanceof test if any of its superclasses implement the interface on the right side of the instanceof operator.



Arithmetic Operators

- There are four primary math operators: add, subtract, multiply, and divide.
- The remainder operator (%), returns the remainder of a division.
- Expressions are evaluated from left to right, unless you add parentheses, or unless some operators in the expression have higher precedence than others.
- The *, /, and % operators have higher precedence than + and -.



String Concatenation Operator

- If either operand is a String, the + operator concatenates the operands.
- If both operands are numeric, the + operator adds the operands.



Increment/Decrement Operators

- Prefix operators (++ and --) run before the value is used in the expression.
- Postfix operators (++ and --) run after the value is used in the expression.
- In any expression, both operands are fully evaluated *before* the operator is applied.
- Variables marked final cannot be incremented or decremented.



Ternary (Conditional Operator)

- Returns one of two values based on whether a boolean expression is true or false.
 - Returns the value after the ? if the expression is true.
 - Returns the value after the : if the expression is false.



Logical Operators

- The exam covers six "logical" operators: `&`, `|`, `^`, `!`, `&&`, and `||`.
- Logical operators work with two expressions (except for `!`) that must resolve to boolean values.
- The `&&` and `&` operators return true only if both operands are true.
- The `||` and `|` operators return true if either or both operands are true.
- The `&&` and `||` operators are known as short-circuit operators.
- The `&&` operator does not evaluate the right operand if the left operand is false.
- The `||` does not evaluate the right operand if the left operand is true.
- The `&` and `|` operators always evaluate both operands.
- The `^` operator (called the "logical XOR"), returns true if exactly one operand is true.
- The `!` operator (called the "inversion" operator), returns the opposite value of the boolean operand it precedes.