# Object-Oriented Programming Fundamentals

**Java operator precedence from highest to lowest**

+ - ++ -- ! (unary operators)

\* / %

+ - (binary +, - operators)

< > <= >=

== !=

&&

||

=

**Distribution over relational operators**

! (a >= b) ⇔ a < b

! (a > b) ⇔ a <= b

! (a <= b) ⇔ a > b

! (a < b) ⇔ a >= b

! (a == b) ⇔ a != b

! (a != b) ⇔ a == b

**De Morgan’s law**

! ( a && b) ⇔ !a || !b

! (a || b) ⇔ !a && !b

|  |  |  |
| --- | --- | --- |
| **Operator** | **Operand type** | **Result** |
| && | boolean | Boolean ‘and’ with short circuit evaluation |
| & | boolean | Boolean ‘and’ with complete evaluation |
| & | integer types | Bitwise ‘and’ |
| || | boolean | Boolean ‘or’ with short circuit evaluation |
| | | boolean | Boolean ‘or’ with complete evaluation |
| | | integer types | Bitwise ‘or’ |
| ^ | boolean | Boolean XOR |
| ^ | Integer types | Bitwise XOR |