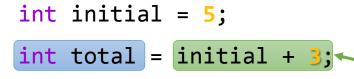In this section, we will cover Java's syntax for mathematical expressions, the different operators Java uses for arithmetic and a few example problems.

# Java Math

## CSCI 1250 Study Guide

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# Math Syntax

```
int initial = 5;
int total = initial + 3;
```

**Destination**

The Left Side (LS) of the equals sign will be the variable that will be holding the result of our mathematical expression.  In Java, the LS of the equals sign, is reserved for variables.  Never place math expressions on the LS!

**Math Expression**

The Right Side (RS) of the equals sign will be our math expression.  The result from this calculation is then fed into the variable on the LS.

# Math Symbols

| Declared/Initialized Variables | **int** firstValue **= 5;**<br>**int** secondValue **= 7;**<br>**int** result**;** | |
|---|---|---|
| **Symbol** | **Definition & Example** | |
| **+** | Addition<br>    result **=** firstValue **+** secondValue**;//result equals 12**<br>    result **=** firstValue **+ 22;//result equals 27** | |
| **-** | Subtraction<br>    result **=** firstValue **–** secondValue**;//result equals -2**<br>    result **=** secondValue **– 3;//result equals 4** | |
| **/** | Division<br>    result **=** firstValue **/** secondValue**;//result equals 0**<br>    result **= 10 /** firstValue**;//result equals 2** | |
| **\*** | Multiplication<br>    result **=** firstValue **\*** secondValue**;//result equals 35**<br>    result **=** secondValue **\* 2;//result equals 14** | |
| **%** | Modulus (find remainder)<br>    result **=** secondValue **%** firstValue**;//result equals 2**<br>    result **=** secondValue **% 2;//result equals 1** | |

## Compound Operators

| Symbol | Example | Equivalent |
|---|---|---|
| **+=** | firstValue **+= 5;** | firstValue **=** firstValue **+ 5;** |
| **-=** | secondValue **-= 2;** | secondValue **=** secondValue **- 2;** |
| **/=** | firstValue **/= 1;** | firstValue **=** firstValue **/ 1;** |
| **\*=** | secondValue **\*= 3;** | secondValue **=** secondValue **\* 3;** |
| **%=** | firstValue **%= 4;** | firstValue **=** firstValue **% 4;** |

# Order of Operations

Java follows order of operations, so be careful how you right your math formulas! Remember order of precedence:

| Operation | -<br>Negation | ( )<br>Parenthesis | * / % | + - |
|-----------|---------------|--------------------|-------|-----|
| Priority  | 1             | 2                  | 3     | 4   |

Examples:

```
int value = 5 * 2 - 3;

             10 - 3

int value =     7


int result = (5 - 2) * 3 + 8 / 2;

              3 * 3 + 8 / 2;

              9 + 8 / 2;

              9 + 4;

int result =         13;


int quote = (6 + 6) / (13 - 1);

             12  /  (13 - 1);

             12  /   12;

                  1
```