

Expressions and Assignment Statements

Computing integers

```
int x = 2;
```

```
int y = 4;
```

```
int sum = x + y;
```

```
System.out.println(sum);
```

What is the output?

Output: 6



Computing integers

The outcome is the same as mathematical operations:

`int x = 4;`

`int y = 8;`

`x + y`  12

`x - y`  4

`x * y`  32

`x / y`  2



Modulus

Modulus (%): Divide and take the remainder

```
int x =17;
```

```
int y = 5;
```

```
int z = x % y
```

What is the output?

Output: 2



Order of Operations

1. Parentheses $()$
2. Multiplication and Division $*$ / $\%$
3. Addition and Subtraction $+$ -

If there are multiple instances of same precedence, read left to right.



Order of operations

```
int myNum = (4 + 6 * (2 * 3) - 2)
```

```
System.out.println(myNum)
```

What is the output?

Output: 38



Order of operations (int and double)

Integer and double values follow the same order of operations.

```
int x = 5;
```

```
int y = 2;
```

```
System.out.println(x / y);
```

Output: 2

The result is an integer, so it gets **truncated**.



Double division

```
double x = 5;
```

```
double y = 2;
```

```
System.out.println(x / y);
```

Output: 2.5

Double division retains the decimals.



Mixed division

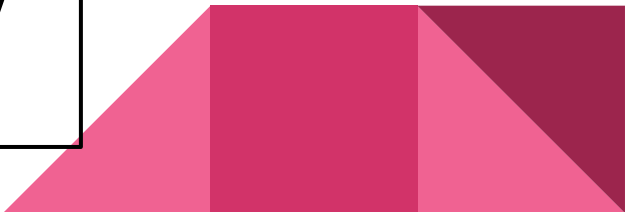
```
double x = 5;
```

```
int y = 2;
```

```
System.out.println(x/ y);
```

Output: 2.5

An int divided by double or a double divided by int will result in a double.



Dividing by Zero

`int x = 5 / 0;`



This will throw an **ArithmeticException**.

`double y = 5.0 / 0;`



Infinity



What is the result of this expression?

$150 \% 100$

1. 0
2. 100
3. 50
4. 3



What will be the output of the following code snippet?

```
public class Calculator
{
    public static void main(String[] args)
    {
        int first = 7;
        int second = 2;
        int result = first / second;
        System.out.println(result);
    }
}
```

1. 3.5
2. 3.50
3. 3
4. 3 1/2



Shortcuts

It is common in programming to add one or subtract one to a variable.

There are some shortcuts to do that:

`myNum = myNum + 1;` `myNum++;`

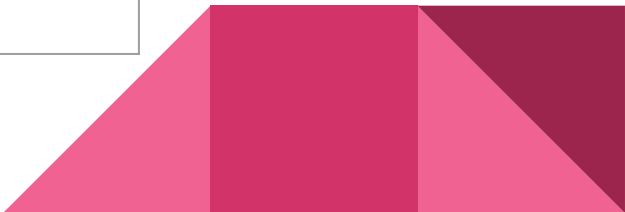
`myNum = myNum - 1;` `myNum--;`



More shortcuts

It is common to modify the current value by adding/subtracting/multiplying/dividing another value.

<code>x = x + y;</code>	<code>x += y;</code>
<code>x = x - y;</code>	<code>x -= y;</code>
<code>x = x * y;</code>	<code>x *= y;</code>
<code>x = x / y;</code>	<code>x /= y;</code>
<code>x = x % y;</code>	<code>x %= y;</code>



Computing strings: String data type

values	Sequences of characters
Typical literals	"Hello, " "1 " " * "
operation	concatenate
operator	+

* **Literal:** Any fixed value (not variables or expressions).

"apcsa", 26, 3.14, true, '&', -2.5

* **Identifier:** A name given to a class, variable or method.

Concatenation examples

expression	value
"Hi, " + "Bob"	"Hi, Bob"
"1 " + " 2 " + "1"	"1 2 1"
"1234" + " + " + "99"	"1234 + 99"
"1234" + "99"	"123499"