Arithmetic Operators

Arithmetic Operators

NAME	OPERATOR	PURPOSE&NOTES	EXAMPLE	RESULT
ADDITION	+	Adds one value to another	10+5	15
SUBTRACTION	-	Subtracts one value from another	10-5	5
DIVISION	/	Divides two values	10/5	2
MULTIPLICATION	*	Multiplies two values	10*5	50
MODULUS	%	Divides two values and returns the remainder	10%3	1

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Arithmetic Operators

```
amount = 4+8;                 //Assigns 12 to amount
total = price + tax;          //Assigns price + tax to total
number = number + 1;          //Assigns  number + 1 to number

temperature = 112 – 14;       //Assigns 98 to temperature
sale =  price – discount;     //Assigns price – discount to sale
number = number -1;           //Assigns number -1 to number
```

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Arithmetic Operators

```
points = 100 / 20;                  //Assigns 5 to points
teams = players / maxEach;   //Assigns players / maxEach to teams
half = number / 2;                 //Assigns number / 2 to half

leftover = 17 % 3;    //Assigns 2 to leftover
```

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Task

- What is the output of this code?

```
int outcome = 12+6/3;
System.out.println(outcome);
```

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Operator Precedence

The operators at the top of the table have higher precedence than the ones below them

Precedence of arithmetic operators(highest to lowest)	
Highest Precedence	- (unary negation)
	* / %
Lowest Precedence	+ -

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Operator Precedence

If two operators sharing an operand have the same precedence, they work according to their associativity. Associativity is either left to right or right to left.

Associativity of arithmetic operators	
Operator	Associativity
* / %	Left to right
+ -	Left to right

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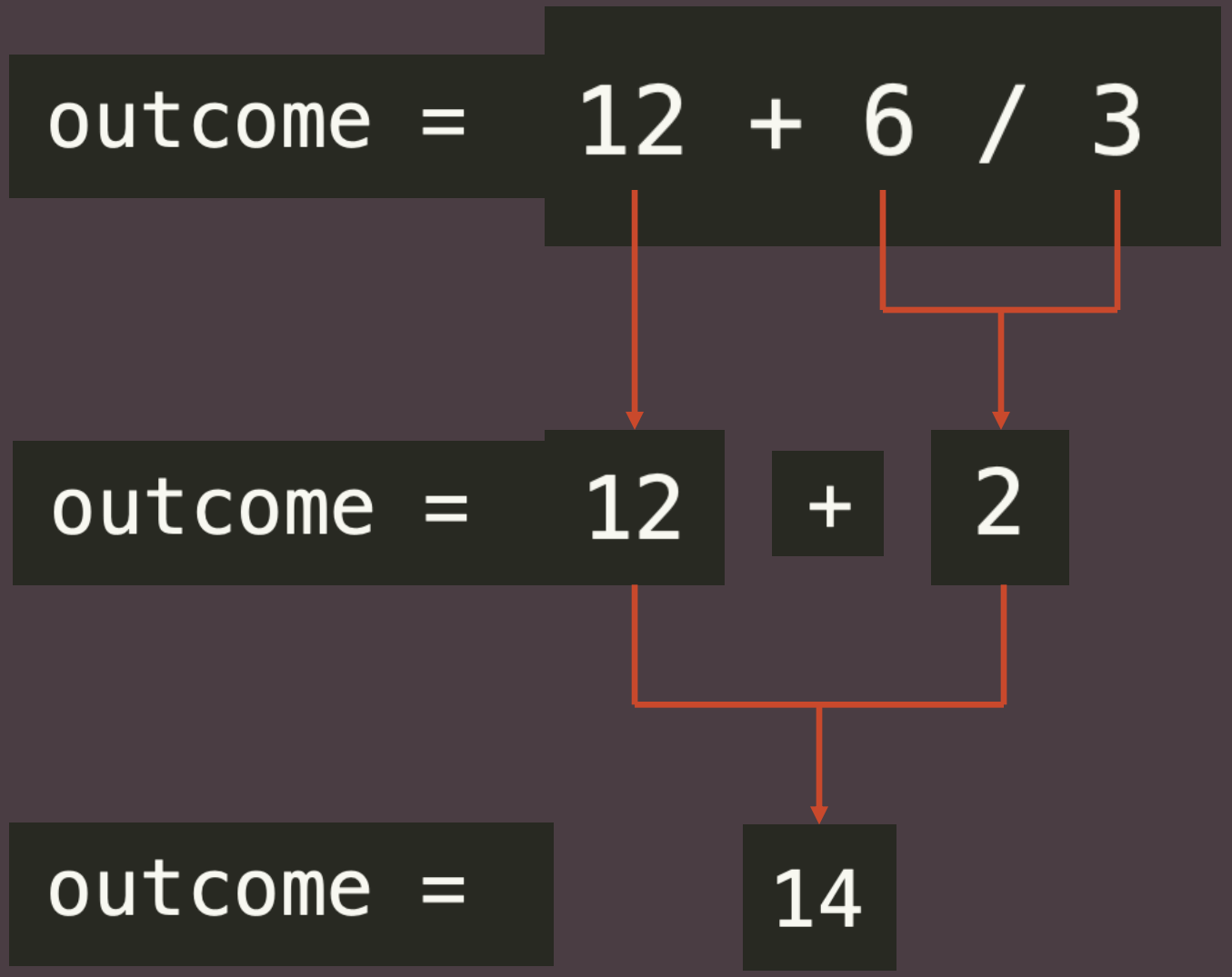

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Task

```
5 + 2 * 4

10 / 2 - 3

8 + 12 * 2 - 4

4 + 17 % 2 - 1

6 - 3 * 2 + 7 - 1
```

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Grouping with Parentheses

- Parts of a mathematical expression may be grouped with parentheses to force some operations to be performed before others.

```
average = (a+b+c+d) / 4.0;
```

- Without the parentheses, d would be divided by 4 and the results added to a,b, and c

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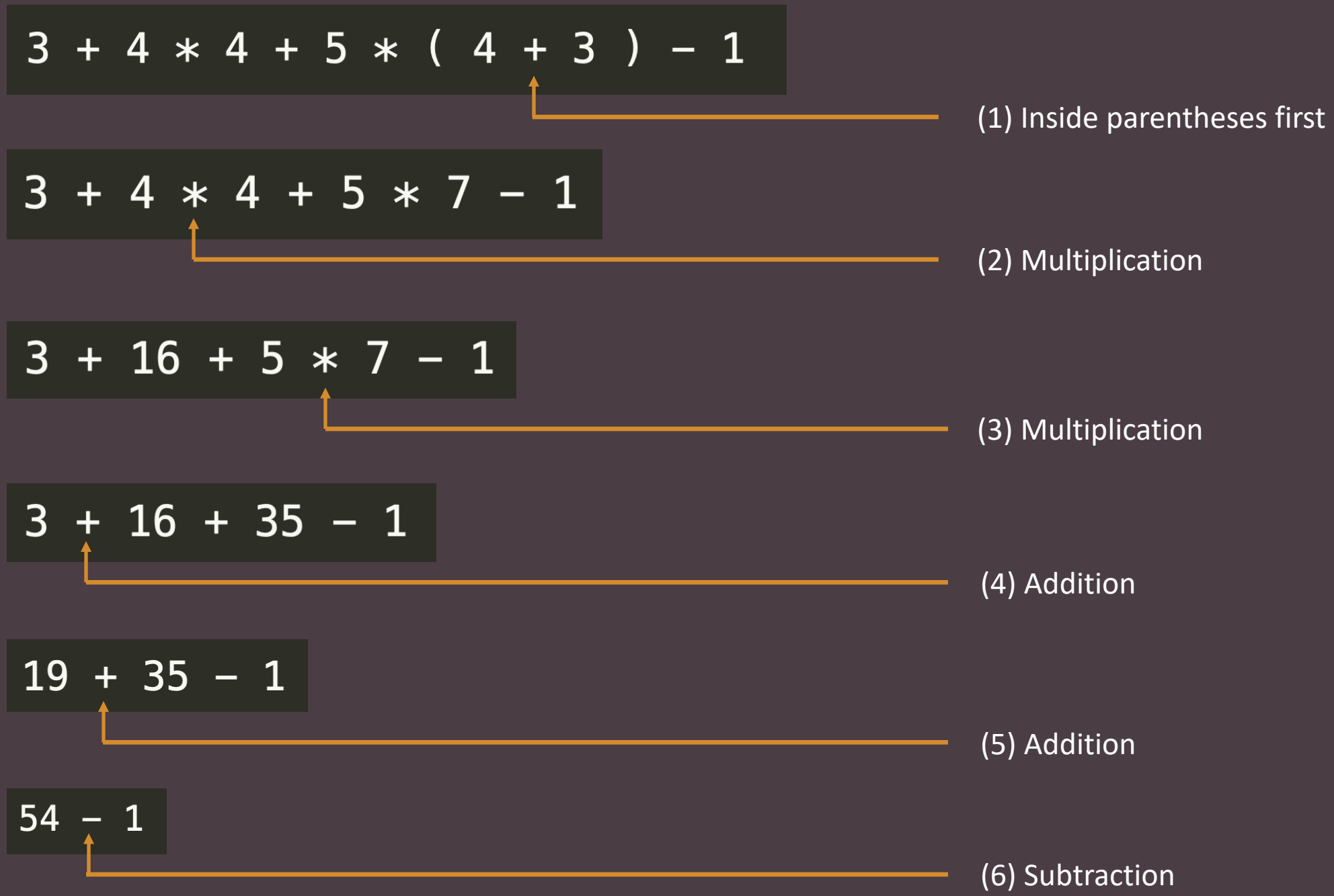
3 + 4 * 4 + 5 * (4 + 3) - 1
(1) Inside parentheses first
3 + 4 * 4 + 5 * 7 - 1
(2) Multiplication
3 + 16 + 5 * 7 - 1
(3) Multiplication
3 + 16 + 35 - 1
(4) Addition
19 + 35 - 1
(5) Addition
54 - 1
(6) Subtraction

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Task

```
(5 + 2) * 4

10 / (5 - 3)

8 + 12 * (6 - 2)

(4 + 17) % 2 - 1

(6 - 3) * (2 + 7) / 3
```

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Task

1. Write a Java program that will print a sum of two numbers

Please use variables to store num1,num2,and sum

Sample output:

46 + 90 = 136

2. Write a Java program to convert Fahrenheit to Celcius

F=9*C/5+32

3. Write a Java program that converts mile to km

1 mile = 1.609344 km

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Task

1. Write a Java program that displays the area and perimeter of a circle that has a radius of 5.5 using the following formulas:

perimeter = 2 * radius * π

area = radius * radius * π

2. Write a Java program that displays the area of a rectangle with a width of 4.5 and a height of 7.9 using the following formula:

area = width * height

3. Write a Java program that calculates the average of 3 numbers.

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