

1.3 Expressions and Output

Name: _____ Class: _____ Date: _____ **Total: 8 marks**

KEY WORDS integer division 整数除法 • expression 表达式 • operator precedence 运算符优先级
• type 类型 • casting 类型转换

Objective

Build the skills to answer exam questions on **expressions and output**.

You must be able to:

- evaluate arithmetic **expressions** 表达式 using +, -, *, /, and %
- understand **integer division** 整数除法 and the remainder operator %
- apply **operator precedence** 运算符优先级
- use `System.out.print` and `System.out.println`

1 Worked examples

Study these first. Each one shows the method for a question type used later.

■ Arithmetic and integer division

With two `int` operands, `/` is **integer division** (the fraction is dropped) and `%` gives the remainder: `7 / 2` is 3 and `7 % 2` is 1.

■ Precedence and mixing types

`*`, `/`, `%` are done before `+`, `-`; use parentheses to change the order. Mixing an `int` and a `double` gives a `double`: `5 / 2.0` is 2.5.

■ Output

`System.out.print` writes without a newline; `System.out.println` adds a newline at the end.

2 Practice

2.1 Evaluate `7 / 2` in Java (integer division). [1]

2.2 Evaluate `7 % 2`. [1]

2.3 State the difference between `print` and `println`. [1]

3 Exam-style questions

3.1 In Java, `9 / 4` evaluates to [1]

- **A** 2.25
- **B** 2
- **C** 3
- **D** 1

3.2 `System.out.println` differs from `print` by [1]

- **A** printing nothing
- **B** adding a newline at the end
- **C** rounding the value
- **D** casting the value

3.3 Evaluate the following.

(a) `10 % 3`. [1]

(b) `10 / 3`. [1]

(c) State the value **and type** of `10 / 3.0`. [1]

Solutions

2.1 3.

2.2 1.

2.3 `println` moves to a new line after printing; `print` does not.

3.1 B.

3.2 B.

3.3 (a) 1. (b) 3. (c) about 3.33, a `double`.