

1 Variables and data types – Part 1

Name: _____ Class: _____ Date: _____

Vocabulary 词汇

Write each word three times. 把每个单词抄写三遍。

English	中文	Write it 3 times (English)
variable	变量	_____
data type	数据类型	_____
expression	表达式	_____

Recall

You may have written a little code before, or used a calculator app:

- A program stores values and does calculations with them.
- Numbers can be whole (like 5) or decimal (like 2.5).
- Text and numbers are different kinds of data.

This sheet lines up variables and data types in Java. Each idea has a worked example.

New ideas

■ 1 Variables

A **variable** 变量 is a named box that stores a value. You give it a type and a name, then a value:

```
int age = 16;
double price = 2.5;
```

■ 2 Data types

A **data type** 数据类型 says what kind of value a variable holds:

integer	whole number: 7
real	decimal: 3.5
char	one letter: 'A'
string	text: "hello"
boolean	true or false

- **int** – a whole number,
- **double** – a decimal number,
- **boolean** – true or false,
- **String** – text.

■ 3 Expressions

An **expression** 表达式 combines values with operators (+ - * / %) to compute a result.

Worked example. $3 + 4 * 2$ is 11 (multiply before add), and $10 \% 3$ is 1 (the remainder).

■ 4 Integer division

When you divide two whole numbers, Java throws away the fractional part:

Worked example. $7 / 2$ is 3 (not 3.5), but $7.0 / 2$ is 3.5 (a decimal forces real division).

Watch out: dividing two **int** values **truncates** – $5 / 2$ gives 2, not 2.5. To get a decimal, make one value a **double** first.

Practice

Try these in order. The methods are all above.

2.1 State what data type you would use for (a) a person's age, (b) their height in metres, (c) whether they passed. ^[3]

2.2 Evaluate $2 + 3 * 4$. [2]

2.3 Evaluate $9 / 2$ and $9 \% 2$. [2]

2.4 Evaluate $9.0 / 2$. [1]

2.5 Explain why $1 / 2$ gives 0 in Java. [2]