AP COMPUTER SCIENCE A • EXERCISE SHEET

2.8 for Loops

Name: _____ Class: _____ Date: _____ **Total: 9 marks**

Objective

Build the skills to answer exam questions on **for loops**.

You must be able to:

- write a **for loop** 计数循环 with an initialization, a condition, and an update
- understand how a for loop packs the setup, test, and change into one line
- rewrite a while loop as an equivalent for loop

1 Worked examples

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

for loop

```
for (int i = 0; i < 5; i++) {
    System.out.print(i);   // prints 01234
}
```

The header has three parts: **initialization** (`int i = 0`), **condition** (`i < 5`), and **update** (`i++`).

Equivalent while

The same logic could be written as a while loop; the for loop just gathers the setup, test, and change in one place.

2 Practice

2.1 Name the three parts of a for loop header. [2]

2.2 State how many times `for (int i = 0; i < 5; i++)` runs its body. [1]

2.3 State one advantage of a for loop over a while loop. [1]

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3 Exam-style questions

3.1 The three parts of a for loop header are initialization, condition, and [1]

- **A** body
- **B** update
- **C** return
- **D** cast

3.2 `for (int i = 1; i <= 3; i++)` runs its body [1]

- **A** 2
- **B** 3
- **C** 4
- **D** infinitely many

times.

3.3 `for (int k = 0; k < 4; k++) System.out.print(k);`.

(a) State the output. [1]

(b) State how many times the body runs. [1]

(c) State the value of `k` that first stops the loop. [1]

4 Go further

- work through the **2.8 for Loops** lesson on the **Learn** page;
- read the **Iteration** section of the AP Computer Science A handout on the **Know** page.

Solutions

2.1 initialization, condition, update.

2.2 5 times.

2.3 it keeps the setup, test, and change together in one line.

3.1 B.

3.2 B.

3.3 (a) `0123`. (b) 4 times. (c) `k = 4`.