AP COMPUTER SCIENCE A • EXERCISE SHEET

4.4 Array Traversals

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

Objective

Build the skills to answer exam questions on **array traversals**.

You must be able to:

- **traverse** 遍历 an array with a `for` loop that visits every index
- use an **enhanced for loop** 增强 for 循环 (for-each) to read each element
- understand that a for-each loop **cannot replace** elements in the array

1 Worked examples

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

Standard for traversal

```
for (int i = 0; i < a.length; i++) {
    System.out.println(a[i]);   // has the index i
}
```

Enhanced for (for-each)

```
for (int x : a) {
    System.out.println(x);   // reads each element
}
```

A for-each loop is simpler for **reading**, but it **cannot replace** the elements in the array —for that you need the index.

2 Practice

2.1 State the loop range used to visit every index of an array `a`. [1]

2.2 State what an enhanced for loop **cannot** do. [1]

2.3 State how many elements a for-each loop over array `a` visits. [1]

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3 Exam-style questions

3.1 An enhanced for loop (for-each) is used to [1]

- **A** replace elements
- **B** read each element
- **C** create the array
- **D** sort the array

3.2 A standard for loop over array `a` runs from `0` to [1]

- **A** `a.length`
- **B** `a.length - 1`
- **C** `1`
- **D** `a.length + 1`

3.3 `int[] a = {3, 6, 9};`.

(a) Write the loop condition for a standard for loop over `a` (using `i`). [1]

(b) State whether a for-each loop can change `a`'s values. [1]

(c) State how many elements a for-each loop visits. [1]

4 Go further

- work through the **4.4 Array Traversals** lesson on the **Learn** page;
- read the **Array** section of the AP Computer Science A handout on the **Know** page.

Solutions

2.1 from `0` to `a.length - 1`.

2.2 replace (change) the elements of the array.

2.3 all of them (here 3).

3.1 B.

3.2 B.

3.3 (a) `i < a.length`. (b) no. (c) `3`.