

## 4.4 Array Traversals

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Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

Total: 8 marks

KEY WORDS enhanced for loop 增强 • traverse 遍历 • array 数组

### Objective

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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

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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

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

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

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

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### 3 Exam-style questions

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**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
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**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`
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**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]

## Solutions

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**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.