

4.8 ArrayList Methods

Name: _____ Class: _____ Date: _____

Total: 8 marks

Objective

Build the skills to answer exam questions on **ArrayList** methods.

You must be able to:

- create an **ArrayList** 动态数组 that can grow and shrink
- use **add**, **get**, **set**, **remove**, and **size**
- understand that an ArrayList stores **objects** (primitives as wrappers)

1 Worked examples

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

■ ArrayList

Unlike an array, an **ArrayList** can grow and shrink as elements are added or removed:

```
ArrayList<Integer> list = new ArrayList<>();  
list.add(5);           // [5]  
list.get(0);           // returns 5  
list.size();           // 1
```

- **add**, **get**, **set**, **remove**, and **size** are the core methods.
- An ArrayList stores **objects**, so primitives are stored as wrappers (an **int** becomes an **Integer**).

■ A worked sequence

Start empty, then:

```
list.add(5); list.add(8); // [5, 8]  
list.set(0, 3);          // [3, 8]  
list.remove(1);           // [3]
```

remove(1) deletes the element at **index 1** (the 8), leaving [3], so **list.size()** is now 1.

2 Practice

2.1 State one way an `ArrayList` differs from an array. [1]

2.2 Name the method that returns the number of elements. [1]

2.3 State what `list.get(0)` returns. [1]

3 Exam-style questions

3.1 To add an element to an `ArrayList`, you use [1]

- **A** `add`
 - **B** `length`
 - **C** `new`
 - **D** `size`
-

3.2 The number of elements in an `ArrayList` is found with [1]

- **A** `.length`
 - **B** `.size()`
 - **C** `.count`
 - **D** `.get()`
-

3.3 `ArrayList<String> a = new ArrayList<>(); a.add("hi"); a.add("bye");`

(a) State `a.size()`. [1]

(b) State `a.get(1)`. [1]

(c) State whether an `ArrayList` can grow. [1]

4 Go further

- work through the **4.8 ArrayList Methods** lesson on the **Learn** page;
- read the **ArrayList** section of the AP Computer Science A handout on the **Know** page.

Solutions

2.1 an ArrayList can grow and shrink, while an array has a fixed size.

2.2 `size()`.

2.3 the first element of the list.

3.1 A.

3.2 B.

3.3 (a) 2. (b) "bye". (c) yes.