

3.3 Anatomy of a Class

Name: _____ Class: _____ Date: _____

Total: 9 marks

Objective

Build the skills to answer exam questions on **the anatomy of a class**.

You must be able to:

- identify the parts of a **class** 类: instance variables, constructors, and methods
- declare **instance variables** 实例变量 to hold each object's state
- use **private** and **public** to control **encapsulation** 封装

1 Worked examples

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

■ Parts of a class

- **Instance variables** —hold the object's **state** (data).
- **Constructors** —set up a new object.
- **Methods** —the object's behaviour.

■ Encapsulation

Declaring instance variables **private** **hides** them, so they can only be changed through **public** methods —this is **encapsulation**, which protects an object's data.

2 Practice

2.1 Name the three parts of a class. [2]

2.2 State what instance variables hold. [1]

2.3 State the access modifier used to hide data. [1]

3 Exam-style questions

3.1 The state of an object is held in its [1]

- **A** methods
 - **B** instance variables
 - **C** constructors
 - **D** comments
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3.2 To hide a class's data, declare it [1]

- **A** public
 - **B** private
 - **C** static
 - **D** void
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3.3 A `BankAccount` class stores a balance.

(a) Name what the balance is (which part of the class). [1]

(b) State the modifier to keep it hidden. [1]

(c) Name the idea of hiding data behind methods. [1]

4 Go further

- work through the **3.3 Anatomy of a Class** lesson on the **Learn** page;
- read the **Writing Classes** section of the AP Computer Science A handout on the **Know** page.

Solutions

2.1 instance variables, constructors, methods.

2.2 the state (data) of each object.

2.3 private.

3.1 B.

3.2 B.

3.3 (a) an instance variable. (b) private. (c) encapsulation.