

1.3 Program Design and Development

Name: _____ Class: _____ Date: _____

Total: 8 marks

Objective

Build the skills to answer exam questions on **program design and development**.

You must be able to:

- describe the **iterative** 迭代 and incremental nature of development
- use a process to investigate, design, **prototype** 原型, and test
- create a **program requirements** 程序需求 description
- document a program with clear **comments** 注释

1 Worked examples

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

■ Iterative development

Programs are built in **repeated cycles**: design → prototype → test → refine, again and again, improving each time.

■ Requirements and planning

A **requirements** description captures what the user needs. Good practice is to **plan** the program before writing code.

■ Comments

Comments are notes in the source code that explain **how and why** it works, helping others (and your future self) understand it.

2 Practice

2.1 State what "iterative" development means. [1]

2.2 State the purpose of a program requirements description. [1]

2.3 State why programmers add comments to their code. [1]

3 Exam-style questions

3.1 An iterative development process is one that [1]

- **A** never changes
 - **B** repeats and refines
 - **C** skips testing
 - **D** has no plan
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3.2 Comments in a program are used to [1]

- **A** make it run faster
 - **B** explain how and why the code works
 - **C** store data
 - **D** create loops
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3.3 A student plans, builds, tests, then improves a program over several cycles.

(a) Name this kind of process. [1]

(b) State one step done before writing code. [1]

(c) State one benefit of adding comments. [1]

4 Go further

- work through the **1.3 Program Design and Development** lesson on the **Learn** page;
- read the **Creative Development** section of the AP Computer Science Principles handout on the **Know** page.

Solutions

2.1 developing in repeated cycles, refining the program each time.

2.2 to capture what the user needs the program to do.

2.3 to explain how and why the code works.

3.1 B.

3.2 B.

3.3 (a) an iterative (and incremental) process. (b) investigate needs / write requirements / design or plan (any one). (c) it makes the program easier to understand and maintain.