AP COMPUTER SCIENCE PRINCIPLES • EXERCISE SHEET

# 3.15 Random Values

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

## Objective

Build the skills to answer exam questions on **random values**.

**You must be able to:**

- explain how a program generates a **random** 随机 value within a range
- use a random number to introduce **variability** 变化
- apply random values to model **unpredictable** 不可预测 events
- explain why repeated runs can produce different outputs

## 1 Worked examples

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

### ■ Random values

A program can generate a **random** value within a specified range to introduce **variability** into its behaviour.

### ■ Modelling chance

Random values model **unpredictable** events such as a dice roll or coin flip.

### ■ Different outputs

Because the value is random, running the same program again can produce a **different output** each time —`random(1, 6)` gives some whole number from 1 to 6.

## 2 Practice

**2.1** State one use of random values in a program. [1]

**2.2** State why a program using randomness can give different results each run. [1]

**2.3** State one everyday event that can be modelled with random values. [1]

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## 3 Exam-style questions

**3.1** A program generates a random number to add [1]

- **A** a syntax error
- **B** variability
- **C** a comment
- **D** a byte

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**3.2** Rolling a die in a program is modelled with a [1]

- **A** fixed value
- **B** random value
- **C** string
- **D** loop

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**3.3** A dice game uses `random(1, 6)`.

(a) State the possible outputs. [1]

(b) State whether two runs must give the same result. [1]

(c) State one reason to use randomness. [1]

## 4 Go further

- work through the **3.15 Random Values** lesson on the **Learn** page;
- read the **Algorithms and Programming** section of the AP Computer Science Principles handout on the **Know** page.

## Solutions

**2.1** any one of: model chance, add variability, shuffle, simulate an event.

**2.2** the random value can differ each time the program runs.

**2.3** a dice roll, a coin flip, or shuffling cards (any one).

**3.1 B**.

**3.2 B**.

**3.3** (a) a whole number from 1 to 6. (b) no. (c) to model an unpredictable event (or add variety).