

3.1 Variables and Assignments

Name: _____ Class: _____ Date: _____

Total: 9 marks

Objective

Build the skills to answer exam questions on **variables and assignments**.

You must be able to:

- explain how a **variable** 变量 is a named reference that stores a value
- use an **assignment** 赋值 statement to store or update a value
- describe how a variable can hold different **data types** 数据类型
- trace how a variable's value changes as a program runs

1 Worked examples

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

■ Variable and assignment

A **variable** is a named box that holds a value in memory. An **assignment** (setting x to 5) stores or updates that value.

■ Data types

A variable can hold a **number**, a **string** (text), or a **Boolean** (true/false).

■ Tracing

Follow the value line by line: set x to 3, then set x to $x + 2$, and x is now 5.

2 Practice

2.1 Define a variable. [1]

2.2 A program sets x to 4, then sets x to $x \times 3$. State the final value of x . [2]

2.3 State one benefit of using descriptive variable names. [1]

3 Exam-style questions

3.1 An assignment statement is used to [1]

- **A** print output
 - **B** store a value in a variable
 - **C** repeat code
 - **D** define a function
-

3.2 Which of these values is a Boolean? [1]

- **A** 42
 - **B** "hello"
 - **C** true
 - **D** 3.14
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3.3 A program runs: set **a** to 10; set **b** to **a** + 5; set **a** to 2.

(a) State the final value of **a**. [1]

(b) State the final value of **b**. [1]

(c) State a good variable name for a value holding a student's age. [1]

4 Go further

- work through the **3.1 Variables and Assignments** 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 a named reference that stores a value in memory.

2.2 $4 \times 3 = 12$.

2.3 it makes the program easier to read and understand.

3.1 B.

3.2 C.

3.3 (a) 2. (b) 15 (set before a changed). (c) any clear name such as `studentAge`.