

1.5 Casting and Range of Variables

Name: _____ Class: _____ Date: _____

Total: 9 marks

KEY WORDS cast 强制类型转换 • casting 类型转换 • integer overflow 整数溢出 • truncates 截断
• type 类型

Objective

Build the skills to answer exam questions on **casting and the range of variables**.

You must be able to:

- use a **cast** 强制类型转换 such as (int) or (double) to convert a numeric type
- understand that casting a **double** to an **int** **truncates** 截断 the fraction
- describe how **integer overflow** 整数溢出 occurs
- round a **double** by adding 0.5 before casting to **int**

1 Worked examples

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

■ Casting

A **cast** converts a value from one numeric type to another. Casting a **double** to an **int** **truncates** (drops) the fractional part: (int) 7.9 is 7.

■ Range and overflow

An **int** can only hold values within a fixed **range**; a result too large causes **integer overflow**.

■ Rounding

To round to the nearest integer, add 0.5 first: (int)(x + 0.5).

2 Practice

2.1 State what casting a **double** to an **int** does to the fractional part.

[1]

2.2 Evaluate `(int) 8.7`.

[1]

2.3 Show how to round `4.6` to the nearest `int` using a cast, and give the result.

[2]

3 Exam-style questions

3.1 `(int) 3.99` evaluates to

[1]

A	B
C	D

A 4

B 3

C 3.99

D 0

3.2 A result too large for the `int` type causes

[1]

A	B
C	D

A truncation

B integer overflow

C a syntax error

D rounding

3.3 Let `double d = 5.8;`

(a) State the value of `(int) d`.

[1]

(b) State the value of `(int)(d + 0.5)`.

[1]

(c) State what a cast from `double` to `int` drops.

[1]