AP CALCULUS BC • EXERCISE SHEET

1.9 Connecting Multiple Representations of Limits

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

Objective

Build the skills to answer exam questions on **connecting multiple representations of limits**.

You must be able to:

- find a limit from a graph, a table, or algebra
- cross-check that the three representations agree

1 Worked examples

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

> ■ **Multiple representations**
>
> A limit can be found from a **graph** 图像, a **table** 表格, or **algebra** 代数—and all three should give the same value. Cross-check when unsure.
>
> ■ **Example**
>
> If algebra gives $\lim = 5$, the table trend is $\to 5$, and the graph approaches 5, the limit is 5.

2 Practice

2.1 Name three ways to find a limit. [1]

2.2 State what should be true across the representations. [1]

2.3 If algebra gives 5 and the table trend is 5, state the limit. [1]

3 Exam-style questions

3.1 A limit can be represented by [1]

- **A** only a graph
- **B** a graph, table, or algebra
- **C** only algebra
- **D** none of these

3.2 The three representations of a limit should [1]

- **A** conflict
- **B** all agree
- **C** give different values
- **D** be ignored

3.3 For a function, algebra gives $\lim = 4$, the table trend is $\to 4$, and the graph approaches 4.

(a) State the value from algebra. [1]

(b) State whether they agree. [1]

(c) State the limit. [1]

4 Go further

- work through the **1.9 Connecting Multiple Representations of Limits** lesson on the **Learn** page;
- read the **Limits and Continuity** section of the AP Calculus BC handout on the **Know** page.

Solutions

2.1 from a graph, a table, or algebra.

2.2 they should all give the same value.

2.3 5.

3.1 B.

3.2 B.

3.3 (a) 4. (b) yes. (c) 4.