

# 1.9 Connecting Multiple Representations of Limits

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Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

Total: 8 marks

## Objective

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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

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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  $\rightarrow 5$ , and the graph approaches 5, the limit is 5.

## 2 Practice

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

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

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

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### 3 Exam-style questions

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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
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3.2 The three representations of a limit should [1]

- **A** conflict
  - **B** all agree
  - **C** give different values
  - **D** be ignored
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3.3 For a function, algebra gives  $\lim = 4$ , the table trend is  $\rightarrow 4$ , 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

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- 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 AB handout on the **Know** page.

## Solutions

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**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.