AP CALCULUS BC • EXERCISE SHEET

1.4 Estimating Limit Values from Tables

Name: _____ Class: _____ Date: _____ **Total: 9 marks**

Objective

Build the skills to answer exam questions on **estimating limit values from tables**.

You must be able to:

- use a **table** 表格 of values approaching a to estimate a limit
- check the trend from both sides

1 Worked examples

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

■ Limits from tables

Tabulate $f(x)$ for x close to a on **both sides**. If the values settle toward one number, that is the estimated limit.

■ Example

$f(1.9) = 3.8$, $f(1.99) = 3.98$, $f(2.01) = 4.02$: the values approach 4, so $\lim_{x\to 2} f(x) \approx 4$.

2 Practice

2.1 State how a table is used to estimate a limit. [1]

2.2 From $f(1.9) = 3.8$, $f(1.99) = 3.98$, $f(2.01) = 4.02$, estimate $\lim_{x\to 2} f(x)$. [2]

2.3 State why you check both sides of a. [1]

3 Exam-style questions

3.1 To estimate a limit from a table, pick x-values [1]

- **A** far from a
- **B** approaching a from both sides
- **C** only greater than a
- **D** equal to a

3.2 If $f(x)$ approaches 7 from both sides, the limit is [1]

- **A** 0
- **B** 7
- **C** undefined
- **D** 14

3.3 Table: $f(2.9) = 5.9$, $f(2.99) = 5.99$, $f(3.01) = 6.01$.

(a) State the left-hand trend. [1]

(b) State the right-hand trend. [1]

(c) State $\lim_{x \to 3} f(x)$. [1]

4 Go further

- work through the **1.4 Estimating Limit Values from Tables** lesson on the **Learn** page;
- read the **Limits and Continuity** section of the AP Calculus BC handout on the **Know** page.

Solutions

2.1 tabulate $f(x)$ for x near a and see what value the outputs approach.

2.2 the values approach 4, so $\lim_{x \to 2} f(x) \approx 4$.

2.3 to confirm the left- and right-hand limits agree.

3.1 B.

3.2 B.

3.3 (a) approaching 6. (b) approaching 6. (c) 6.