

1.4 Estimating Limit Values from Tables

Name: _____ Class: _____ Date: _____

Total: 9 marks

KEY WORDS table 表格 • limit 极限 • right-hand limit 右极限 • approaches 趋近

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 $\lim_{x \rightarrow 2} f(x) \approx 4$.

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 $\lim_{x \rightarrow 2} f(x)$. [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
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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 $\lim_{x \rightarrow 3} f(x)$.

[1]

Solutions

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

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

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.