

Exercise walk-through

Estimating Limit Values from Tables ■ 1.4

eXercise

You must be able to

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

Method — 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.

Method — Example

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

Practice 2.1 ■ 1 mark

State how a table is used to estimate a limit.

Solution 2.1

Worked steps

tabulate $f(x)$ for x near a and see what value the outputs approach **B1**.

Practice 2.2 ■ 2 marks

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

Solution 2.2

Worked steps

the values approach 4, so $\lim_{x \rightarrow 2} f(x) \approx 4$ **M1** **A1**.

Practice 2.3 ■ 1 mark

State why you check both sides of a .

Solution 2.3

Method: Limits from tables

Worked steps

to confirm the left- and right-hand limits agree **B1**.

Exam-style 3.1 ■ 1 mark

To estimate a limit from a table, pick x -values

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

Solution 3.1

Method: Limits from tables

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



Worked steps

B.

Exam-style 3.2 ■ 1 mark

If $f(x)$ approaches 7 from both sides, the limit is

A 0

B 7

C undefined

D 14

Solution 3.2

Method: Limits from tables

A 0

B 7



C undefined

D 14

Worked steps

B.

Exam-style 3.3 ■ 1 mark

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

- (a) State the left-hand trend.
- (b) State the right-hand trend.
- (c) State $\lim_{x \rightarrow 3} f(x)$.

Solution 3.3

Worked steps

(a) approaching 6 **B1**. (b) approaching 6 **B1**. (c) 6 **B1**.