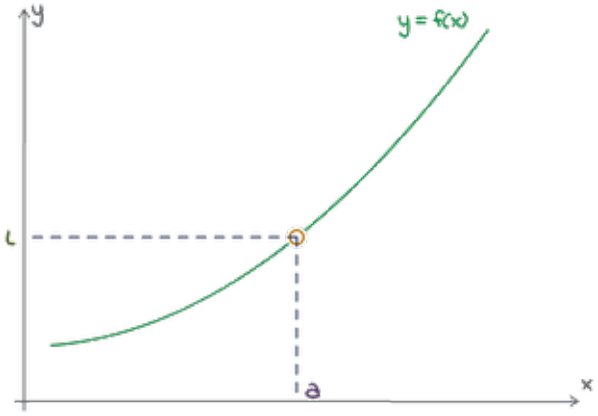
Lecture Notes · Unit 1 · Lecture 2 AP CED 1.2

Limit notation

Tap a blue play button next to a heading to open that part of the video. ▶ Watch the video

WHERE IS F(X) HEADING NEAR 2?

Limit notation AP Calculus 1.2



No f(2) → undefined

Algebra → stuck → calculus → look near 2

where is f(x) heading near a?

Right of 2 → slide toward 2

Left of 2 → slide toward 2

Never lands on 2 → $x \neq 2$

Heights → right, left → 3

As $x \to 2$, $f(x) \to 3$ → 3 is the limit

$\lim_{x \to 2} f(x) = 3$

2 → where x goes, 3 → the limit

f(2) → none · 3 · 1

Limit → 3 · 3 · still 3

$\lim_{x \to 2} f(x) = 3$ $f(2) = 1$ → different

Near 2, not at 2

Numbers → letters: 2 → a, 3 → L

$\lim_{x \to a} f(x) = L$ → L is a real number

PROBLEM 1 OF 2

Write it right

As x gets closer and closer to -1 (but $x \neq -1$), $f(x)$ gets closer and closer to 5.

Which is written correctly?

(A) $\lim_{x \to 5} f(x) = -1$

(B) $\lim_{x \to -1} f(x) = 5$

(C) $\lim f(x) = 5$

(D) $\lim_{x \to -1} = 5$

Solution Check each choice

Plan: xo? cueo f(x) cueo the value

(A) 5 and −1 swapped → no

(B) $x \to -1$, then f(x), then = 5 → yes

(C) x goes where? → no

(D) Limit of what? → no

So (B) → $\lim_{x \to -1} f(x) = 5$

PROBLEM 2 OF 2

What must be true?

If $\lim_{x\to 4} f(x) = 6$, which of the following must be true?

(I) $f(4) = 6$ (II) $f(4)$ is defined.

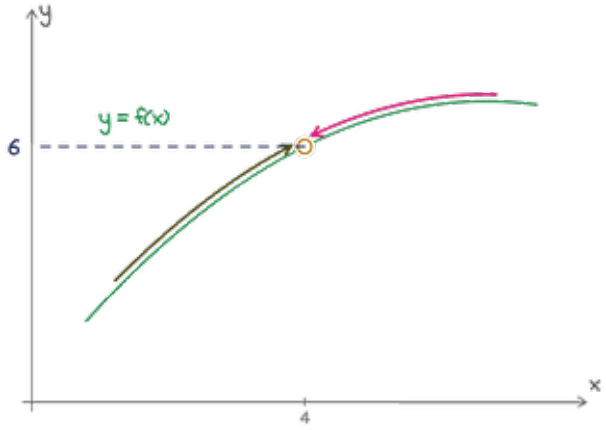
(III) $f(x)$ is as close to 6 as we like for x near 4, $x \neq 4$.

(A) (I) only

(B) (III) only

(C) (I) and (III) only

(D) (I), (II), and (III)



Solution Which statements must be true?

Must → no exceptions → keep

$\lim_{x\to 4} f(x) = 6$

one f → left, right → 6

$\lim_{x\to 4} f(x) = 6$

(III) → meaning of limit → true

f(4)? → f(4) = 2 → limit still 6

→ f(4) ≠ 6 → (I) need not be true

(II) No dot → f(4) undefined, limit 6

→ (II) need not be true

So (B) → (III) only

✗ Limit 6 → so f(4) = 6 → (D)

✓ Near 4, not at 4 → only (III)

Workbook → one more

WRAP-UP

Heading toward its limit

Near a, from both sides, $x \neq a$

one number → $\lim_{x\to a} f(x) = L$

f(a) → a separate question

Workbook → Next: 1.3

Next: the workbook for this topic (link in the video description). Stuck? Ask in the comments.