

FLOWCHART #1: FINDING $\lim_{x \rightarrow a} f(x)$ (ATA POINT)

Is a in the domain of $f(x)$?

YES

NO

Is $f(x)$ a piecewise function?

Why not?

YES

NO

Does $x=a$ lie on the boundary of two "pieces"?

↓ OF NEGATIVE NUMBER ERROR

DIVIDE BY ZERO ERROR

$f(x)$ must look like a quotient of functions!
What does it look like?

NO

EVALUATE $f(x)$ at the point $x=a$:
 $\lim_{x \rightarrow a} f(x) = f(a)$

$f(x) = \frac{b}{h(x)}$,
 b a real number

$f(x) = \frac{g(x)}{h(x)}$,
both top and bottom depend on x

Look at the function from both the left and right of $x=a$. Do the y -values approach the same point? (if so, let's label it by $y=L$)

NO

THE LIMIT DOES NOT EXIST
(it may be ∞ , or $-\infty$ or nothing at all!)

YES

THIS POINT IS THE LIMIT:
 $\lim_{x \rightarrow a} f(x) = L$

SWITCH TO FLOWCHART #2:

for $\lim_{x \rightarrow a} \frac{f(x)}{g(x)}$