Lecture 7

Friday, September 13, 2024 1:02 AM

Last time, we described limits *numerically*. It is not always a reliable method.
For example, consider the limit

$$\lim_{x\to 0} \frac{sqrt(x^4 + 100) - 10}{x\verb|^|4}$$

The table of values:

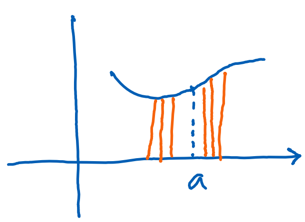
x	f(x)
0.5	0.049995
0.1	0.049999
0.01	0.0500000
0.001	0

You see that the calculator makes an erroer
Today, we will describe limits *graphically*. In the next section (Section 2.3), you will learn how to find a limit *algebraically*. It is most fun to interpret limits graphically.

$$\lim_{x\to a} f(x) = L$$

means f(x) gets closer to L as x gets closer to a, but not equal to a.

Example:



As $x \to a$ (left or right), $f(x) \to f(a)$

This example is an example of a continuous function.

If $\lim_{x\to a} f(x) = f(a)$, we say that f is continuous at a. Otherwise, we say that f is discontinuous at a.

Some examples with piecewise functions

One-sided limits: left-hand limit and right-hand limit.
Example: piecewise functions