Introduction to calculus, project and limit

Calculus is math of continuous change. It is often used in physics, chemistry, biology, economics, etc.

What do you want from this calculus class?

Your project can be about any topic in calculus, which you like or interested in. You may present your project to the audience.

Limit

en.wikipedia.org/wiki/Limit\_of\_a\_function

youtube.com/watch?v=riXcZT2ICjA

This means that for any ε > 0, there exists δ > 0, such that if |x-p| < δ, then |f(x) - L| < ε

It does NOT matter what is f(p) or whether it exists.

Question:

Illustrate definition of limit using ε – δ language.

s is your student number

T = s mod 100

k = s mod 10000

. f(x) = Tx + k. For any ε find δ, using ε – δ definition of the limit.

Question:

When does limit exist?

https://brilliant.org/wiki/when-does-a-limit-exist/

https://en.wikipedia.org/wiki/Limit\_of\_a\_function

Limit exists if it is finite, the same from the left and from the right.

This limit does NOT exist:

List indeterminate forms.

https://en.wikipedia.org/wiki/Indeterminate\_form

0/0, ∞/∞, 1∞

Question:

Use L’Hopital rule to prove First Great Limit of Calculus: 1

1

symbolab.com/solver/limit-calculator

Question:

Calculate Second Great Limit.

Calculate for as small as possible positive x.

Question:

Explain L’Hopital rule.

Calculate First Great Limit using L’Hopital rule.

L’Hopital rule says that

(1)

if the indeterminate form is 0/0 or ∞/∞.

For First Great Limit of calculus

(2)

the indeterminate form is 0 over 0, so we can use L’Hopital rule.

(3)

Question:

Calculate limits of these functions when x goes to zero:

x

1/x

Sin(x)

Cos(x)

Tan(x)

Cot(x)

Log(x)

symbolab.com/solver/limit-calculator