

PROGETTO
ERASMUS+ KA1
«GLOBAL INSIGHTS»

Intervento prof.ssa Caporale Rosa

APPROACH TO FUNCTION

ITS «CARLO ALBERTO DALLA CHIESA» – AFRAGOLA - NA

TEMATICA

L'argomento proposto era già stato studiato, pertanto gli alunni hanno trovato interessante affrontarlo da un altro punto di vista, cogliendo l'opportunità di fare una sintesi sul programma svolto in vista dell'Esame di Stato.

OBIETTIVI DISCIPLINARI

- Conoscere la definizione di funzione continua,
- Riconoscere il grafico di funzioni continue,
- Classificare le funzioni, distinguere i vari tipi di discontinuità,
- Conoscere il concetto di derivata e il suo significato geometrico,
- Enunciare i teoremi sulle funzioni derivabili,
- Riconoscere i punti di non derivabilità

OBIETTIVI LINGUISTICI

- Migliorare le abilità produttive e recettive in lingua inglese;
- Seguire una lezione o una presentazione con powtoon in inglese;
- Acquisire il lessico specifico in L2;
- Utilizzare la microlingua scientifica con le forme verbali tipiche della matematica;
- Utilizzare le opportune funzioni linguistiche e connettivi logici per definire, descrivere, classificare, confrontare, analizzare, progettare, produrre;
- Accedere alle risorse scientifiche on line in lingua inglese;
- Comunicare in modo efficace e fluente in inglese su un argomento matematico.

METODOLOGIA

La metodologia utilizzata durante il progetto è stata della *Flipped Classroom*.

STRUMENTI

E' stato fatto largo uso di tools multimediali e open sources:
LIM - video in lingua originale - video lezioni con PowToon
BACHECA VIRTUALE PADLET per la fruizione e lo scambio di
materiali didattici e autoprodotti
GOOGLE MODULI per sottoporre agli studenti i questionari di
monitoraggio
piattaforma Edmodo, per le comunicazioni e le consegne
Didapages, Epub editor per la realizzazione dell'ebook finale.

PRODOTTO

Progettazione e produzione di un

ebook

multimediale dedicato e elaborato dagli alunni, in modalità cooperativa, contenente un

questionario

sugli argomenti trattati e un

video

di presentazione per la verifica delle competenze integrate.



E' un'applicazione web (web-based) che permette di realizzare presentazioni e video con l'aiuto di simpatiche **animazioni senza dover scaricare ed installare nulla.**



Hi guys!

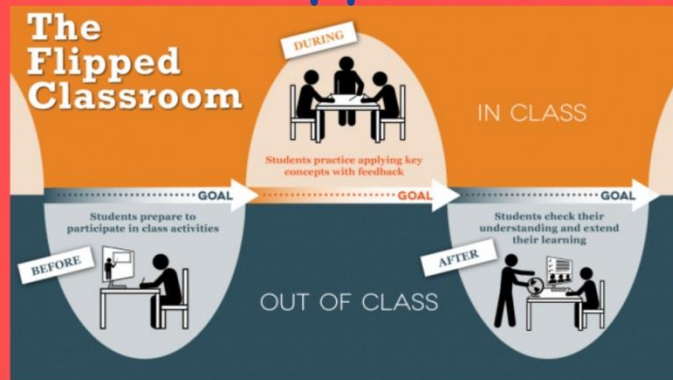
Welcome to the...



The term flipped classroom was popularised by teachers Aaron Sams and Jon Bergman from Woodland Park High School, Colorado in 2007 in response to a realisation that class time would be best spent guiding knowledge and providing feedback rather than delivering direct instruction.



What is the "Flipped classroom"?



WHAT DO STUDENTS DO AT HOME?

"W\$Q" WATCH -SUMMARIZE -QUESTION



WATCH video

- 5-15 minutes long
- Take notes & copy examples in packets
- Pause, rewind, fast forward as needed



WHAT DO STUDENTS DO AT HOME?

"W\$Q" WATCH -SUMMARIZE -QUESTION



SUMMARIZE lesson

- Open summary - write 5-8+ sentences about main points of lesson
- Guided summary - answer "guiding" questions in complete sentences



WHAT DO STUDENTS DO AT HOME?

"W\$Q" WATCH -SUMMARIZE -QUESTION



ask a QUESTION

- one they DON'T KNOW and need help answering
- one they DO KNOW and can challenge their classmates with the next day
- students are challenged to ask a "HOT" questions and are given question starters



Rosa Caporale + 2 = 26g

E-clil

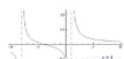
Realizzato con grandi sogni

Flipped Classroom



Points of discontinuity

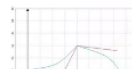
A function that is **continuous** is a function whose graph has no breaks in it. That is, if you continuously draw it, you can draw it without picking up your pencil. Many functions, however, will have isolated points where they are not connected. These problems points are called **discontinuities**.



Points of discontinuity corretto
Word document
padlet drive

Non Differentiable points: Sharp corners, Cusps, Vertical tangent points

If a function is not continuous at a point etc. it is also not differentiable at that point. It may even happen that a function which is continuous is not differentiable at a point etc. No there are three types of continuous functions which are not differentiable functions, and they are: sharp corners, cusp, and vertical tangent points.



point of not differentiable
Word document
padlet drive

Questions

- When a function is said to be differentiable at a point, what?
 - If the derivative of the function not exists at that point.
 - If the derivative of the function exists at that point.
 - If the function is continuous at that point.
 - If the function is not continuous at that point.
- How can the graph be a sharp corner?
 - The new function not exist with sharp corner.
 - The new function not exist with the same sign.
 - The new function not exist with the same value.
 - The new function not exist with the same value but different.
- How is the function to the point of not differentiable?
 - The function is differentiable at all.
 - The function is not differentiable at all and is differentiable at that point.

point of not differentiable que...
Word document
padlet drive

The Derivate

The **derivative** of a function
Describe a function that is defined on an interval $[a, b]$ and a point $x_0 \in [a, b]$ on the graph, where
1) Average rate of change: $\frac{f(b)-f(a)}{b-a}$ and the function along with
2) $f'(x_0) = \lim_{h \rightarrow 0} \frac{f(x_0+h)-f(x_0)}{h}$ using graph.

The derivative of the function is given by:

$$\text{Derivative} = \lim_{h \rightarrow 0} \frac{f(x_0+h)-f(x_0)}{h}$$

and this also defines the average rate of change of $f(x)$ on the interval between x_0 and x_0+h .

The derivate of a function corr...
Word document
padlet drive

Continuous Functions

A function is continuous when its graph is a single continuous curve that you could draw without lifting your pen from the paper (this is not a formal definition, but it helps you understand the idea).

Drawing is not the case. The function of left and right hand side is not continuous. The function is not continuous at the point.

Let $f(x) = \begin{cases} x^2 & \text{if } x < 1 \\ x^2 + 1 & \text{if } x \geq 1 \end{cases}$
A function is continuous at a point if it is continuous at that point.

1.17 The function $f(x) = \begin{cases} x^2 & \text{if } x < 1 \\ x^2 + 1 & \text{if } x \geq 1 \end{cases}$

- Is f a discontinuity at $x=1$?
- Is f a discontinuity at $x=0$?
- Is f a discontinuity at $x=2$?
- Is f a discontinuity at $x=3$?

and discontinuity at $x=1$ is given by:

$$\lim_{x \rightarrow 1^-} f(x) = 1$$

$$\lim_{x \rightarrow 1^+} f(x) = 2$$

$$\lim_{x \rightarrow 1} f(x) = 1$$

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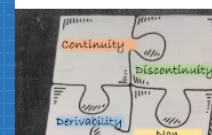
$$\lim_{x \rightarrow 1} f(x) = 2$$

$$\lim_{x \rightarrow 1} f(x) = 1$$

$$\lim_{x \rightarrow 1} f(x) = 2$$

questionario(discontinuity)
Word document
padlet drive

Ebook



Approach to Function
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approach to function

Copertina



Continuous Function



Points Of Discontinuity



The Derivate

Non differentiable points

Questionnaire



Glossary

Links



Continuous Function

A function is continuous when its graph is a single unbroken curve that you could draw without lifting your pen from the paper (That is not a formal definition, but it helps you understand the idea).

Bearing in mind the definitions of left and right limits we can express the condition in an entirely equivalent form:

$$\lim_{x \rightarrow x_0^-} f(x) = \lim_{x \rightarrow x_0^+} f(x) = f(x_0)$$

In other words, a function is continuous in a point if:

- the two left and right limits exist, are finite and have the same value
- the common value of the two left and right limits coincides with the evaluation of the function at the point.

More concretely, a function $f(x)$ in a single variable x is said to be continuous at point x_0 if:

1. $f(x)$ is defined, so that x_0 is in the domain of f ;
2. $\lim_{x \rightarrow x_0} f(x)$ exists ;
3. $\lim_{x \rightarrow x_0} f(x) = f(x_0)$

A graphic example can be :

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Copertina



Continuous Function



Points Of Discontinuity



The Derivate

Non differentiable points

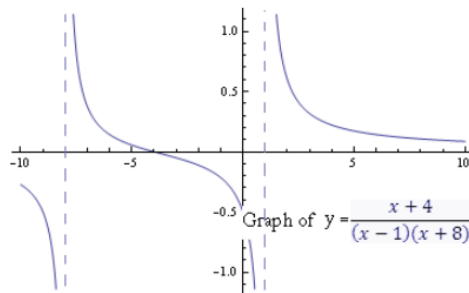
Questionnaire

Glossary

Links

Points of Discontinuity

A function that is continuous is a function whose graph has no breaks in it; that is, it is a continuous curve. Generally speaking, a function is continuous if you can draw its graph without picking up your pencil. Many functions, however, may have isolated points where they are not continuous. These problem points are called discontinuities.



In the function $f(x) = \frac{x+4}{(x-1)(x+8)}$ we know that the domain is limited to all real numbers except 1 and -8.

We can see in the graph that the function behaves very strangely at the holes in the domain. The dotted lines

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Question

Copertina

Continuous Function

Points Of Discontinuity

The Derivate

Non differentiable points

Questionnaire

Question

Question

Question

Question

Question

The function $f(x) = \frac{\sin x}{x}$ in the point $x_0 = 0$:

a. ☐ Has a discontinuity of first species.

b. ☐ Has a discontinuity of third species Which can be deleted by completing the definition in this way

$$f(x) = \begin{cases} \frac{\sin x}{x} & x \neq 0 \\ 0 & x = 0 \end{cases}$$

c. ☐ Has a discontinuity of second species.

d. ☐ Has a discontinuity of third species Which can be deleted by completing the definition in this way

$$f(x) = \begin{cases} \frac{\sin x}{x} & x \neq 0 \\ 1 & x = 0 \end{cases}$$

Conferma

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GRAZIE