



Lifelong Learning Programme



Country: IC + RO

Schools: Menntaskólinn í Kópavogi, Kópavogur, Iceland and Liceul Teoretic Iancu C. Vissarion, Titu, Romania.

Software: Geogebra, Mathemastica, Excel.

Subject: Mathematics.

Topic: Derivative and Integration.

Participating teachers:

Kópavogur: Mrs. Thora Thordardottir
Mrs. Gudrun Angantysdottir

Titu: Mrs. Magdalena Uleia
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Participating students:

Kópavogur: 2 boys

Mr. Helgi Björn Hjartarson

Mr. Jokull Ivarsson

Titu: 2 girls, 2 boys

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Cooperation duration: 28 th February 2015 – 3 th March 2015

Theory: Derivative and Integration

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The Goal of the Cooperation

During our project meeting we worked with software Geogebra to create graphs that show the derivative and the tangent of a function .

We were also use the GeoGebra to calculate the area between two functions .

Derivative

Derivative is used in mathematics to describe the growth of a certain point in a function. Derivative is also used to find the slope of tangent and a function in a certain point. The slope of tangent is the same as the slope of a function in the point where the tangent and the function touch.

Derivative is defined as the limit of the difference function or:

$$f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$$

Example:

Use the definition of derivative to find the slope of the function $f(x) = 2x^2 - 3$ at the point where $x = 2$.

1. Find the point $f(2) = \underline{\hspace{2cm}}$ Then the point is $P = (2, \underline{\hspace{1cm}})$

2. Find the point $f(2+h) = \underline{\hspace{2cm}}$

3. Putting these results from 1 and 2 in the difference function

$$f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h} \qquad f'(2) = \lim_{h \rightarrow 0} \frac{f(2+h) - f(2)}{h} = \underline{\hspace{2cm}}$$

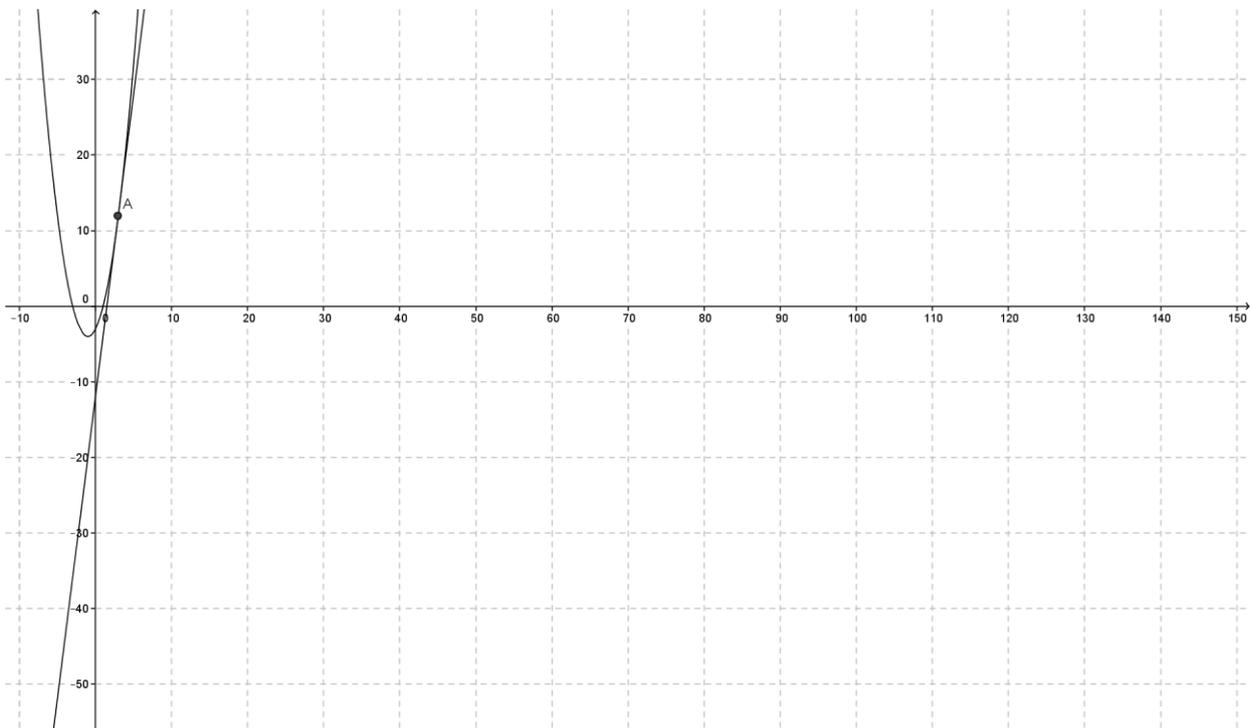
4. From the results you can see that where $h \rightarrow 0$ you have $f'(2) = 4 \cdot 2 = 8$.

5. Use the definition of derivative to find the slope of the function $f(x) = x^2 + 1$ at the point where $x = 3$

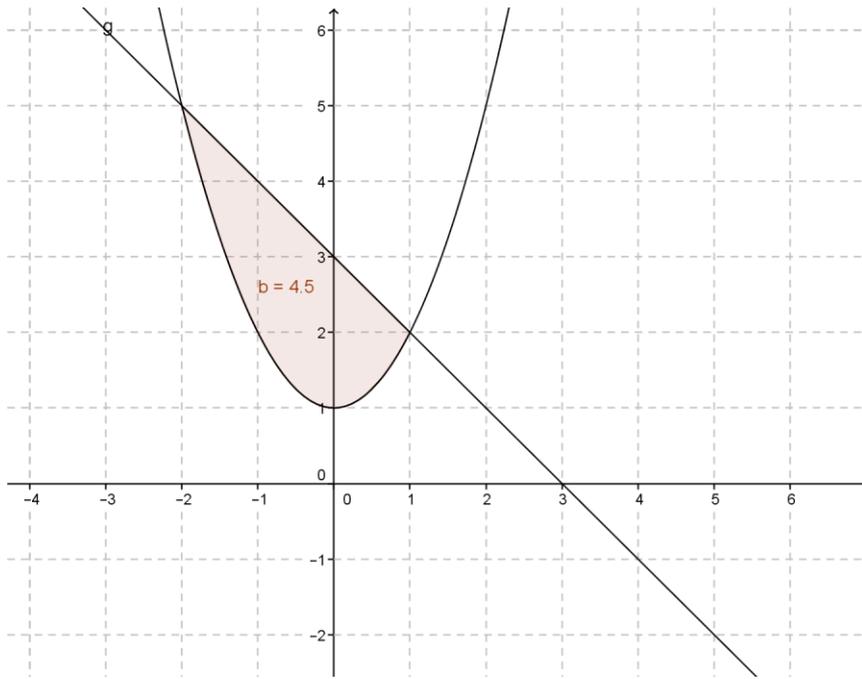
6. Find the definition of the function $f(x) = 7$ and the function $g(x)$ is $5x^2$.

Use GeoGebra to find definition of derivative

Step	Acion	Aids
1	Write the function $2x^2 - 3$ in Input in the bottom.	
2	Write der... in Input and then select the Derivative <Function>]	
3	You need to select the tap button and write in [f] and then the enter button.	
4	Create a point on the new curve by selecting the bottom  when $x = 2$	
5	What result do you have if $x = 2$?	
6	Do this again for the function $f(x) = x^2 + 1$ at the point where $x = 3$	
7	Try to find the derivative of a different function and explain the results.	



Use GeoGebra to find the area between two function



Conclusion

The aim of our project work was to prove the methods to study the derivative and the integration are the same in both countries. Participating students shared data, cooperated and calculated the numbers that helped them to better understand these concepts.