# MA0004 Mathematical Analysis 1

# 4th Seminar

Real function of a real variable and its derivative

## **A. Geometrical Interpretation of Derivative**

**Inquiry-based task**

Input the function  in Geogebra Online. You can use your mobile phones or tablets.

1. Using Geogebra compute .
2. Draw the line  intersecting the points S1, S2.
3. The slope of the line  is equal to 1. Compute the value  and compare it with the slope of the .
4. Create a descending slider  starting at 4 and terminating at -1. Set up the point S1 so its coordinates correspond to the slider . [S1 = (a, f(a))]
5. Modify the slope  definition and substitute the value 4 by the value  of the slider.
6. Start the animation. Follow the changes in the parameter , the line  and its equation.

Final discussion on the definition of some function's derivative and how it is connected with the animation and parts of the figure.

## **B. Differentiation using the elementary formulas**

Find a derivative of the following functions:











## **C. Differentiation of composite functions**

Find a derivative of the following functions:

















## **D. Special modification before differentiation**

Find a derivative of the following functions:







## **E. Tangent line and Normal line**

1. Write the equation of the tangent line and normal line for the function  instersecting the point .









2. Write the equation of the tangent line and normal line

a) for the circle  in its point 

b) for the parabola  in its point 