**Lecture 6**

1. Calculate the first derivatives of the following functions:

|  |  |
| --- | --- |
| a) |  |
| b) |  |
| c) |  |
| d) |  |

2. Calculate the derivative of the function at the given point:

|  |  |
| --- | --- |
| a) |  |
| b) |  |
| c) |  |
| d) |  |

3. Calculate the derivative of the product of two functions

|  |  |
| --- | --- |
| a) |  |
| b) |  |
| c) |  |
| d) |  |
| e) |  |

4. Calculate:

|  |  |
| --- | --- |
| a) |  |
| b) |  |
| c) |  |
| d) |  |

5. Derivate composite function:

In simple words, we say that the derivative of a composite function is **the product of the derivative of the outside function with respect to the inside function and the derivative of the inside function with respect to the variable**.

|  |  |
| --- | --- |
| a) |  |
| b) |  |
| c) |  |
| d) |  |

The derivative of a function y = f(x) of a variable x is **a measure of the rate at which the value y of the function changes with respect to the change of the variable x**. It is called the derivative of f with respect to x.

The second derivative is **the rate of change of the rate of change of a point at a graph** (the "slope of the slope" if you will). This can be used to find the acceleration of an object (velocity is given by first derivative).

If a function f´(x) can be differentiated, we obtain the second derivative of f(x), denoted as f´´(x), and so on.

6. Calculate the first, second and third derivatives of the functions:

|  |  |
| --- | --- |
| a) |  |
| b) |  |
| c) |  |
| d) |  |