

Week: March 1 – March 7, 2021

Topic: **Partial derivatives**

The below provided instructions should guide you through studying the topic. For additional explanation, clarification and extra material contact the Lecture/Tutorial teacher by email or the MS-Teams platform for live online consultation (see webpage for the link).

https://mat.nipax.cz/mathematics:mathematics_ii

After we have introduced the partial derivatives at the end of last week, we will focus on some new notions like differential (and differentiability) of functions of multiple variables. We will speak about derivatives of composite functions, gradient of a function and directional derivative of a function at given point. We will try to explain the geometrical and possible physical interpretation of the newly defined notions. In the second lecture we will introduce the implicitly defined functions and their derivatives.

1) Read and learn the explanation from the textbook. Scanned pages can be found on the web page.

https://mat.nipax.cz/media/mathematics:pages_01-23.pdf

For the second part of the week we will add the new chapter

https://mat.nipax.cz/media/mathematics:pages_24-33.pdf

Additional material and alternative explanation with many figures and exercises can be found in (free) online available textbooks

<http://www.math.wisc.edu/~keisler/calc.html>

namely chapter 11 http://www.math.wisc.edu/~keisler/chapter_11.pdf

<https://openstax.org/details/books/calculus-volume-3>

namely chapter 4 <https://openstax.org/books/calculus-volume-3/pages/4-introduction>

2) Take a look at the solved exercises from our collection of examples

questions: <https://mat.nipax.cz/media/calculus2.pdf>

https://mat.nipax.cz/media/implicit_function.pdf

complete solutions (in Czech): <https://mat.nipax.cz/media/diferencial.pdf>

https://mat.nipax.cz/media/implicitni_funkce.pdf

3) As a training solve (at least) the following exercises.

98, 103, 140, 148, 158– differential, gradient, directional derivative

178, 180, 185, 194 – implicit functions

4) As a long term homework, to be delivered at specified deadline, solve all the corresponding exercises from sample exams from our webpage

https://mat.nipax.cz/media/mathematics:ma2_exam_1n_en.pdf

https://mat.nipax.cz/media/mathematics:ma2_exam_2n_en.pdf

https://mat.nipax.cz/media/mathematics:ma2_exam_3n_en.pdf

The delivery of all sample exams, completely and correctly solved (by yourself) is necessary (but not sufficient) condition for obtaining the assessment from tutorials.