

Week: April 12 – April 18, 2021

Topic: **Triple integral**

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

The triple integral was introduced at the end of last week. This whole week will be dedicated to finishing everything related to triple integral. We will review again the Fubini theorem and different types of elementary domains of integration. Then we will introduce the transformations into cylindrical and spherical coordinates, including their generalized variants. We will try to summarize the general concept of transformations for double and triple integral. At the end of the week, we will come back to geometrical and physical applications of triple integral.

The end of the week will also mean the end of second large chapter, which will bring the deadline for the delivery of the second part of the long term homework. Please work on it and don't leave it to last minute.

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_56-69.pdf

At the end of the chapter please note the explanation about transformations in multiple integrals and see the exercises for both, the double and triple integrals.

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 12 http://www.math.wisc.edu/~keisler/chapter_12.pdf

<https://openstax.org/books/calculus-volume-3/pages/1-introduction>

namely chapter 5 <https://openstax.org/books/calculus-volume-3/pages/5-introduction>

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

questions: https://mat.nipax.cz/media/triple_integral.pdf

complete solutions (in Czech): https://mat.nipax.cz/media/trojny_integral.pdf

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

380, 381, 387 – solved without substitution (transformation)

393, 402, 421 – solved with substitution (transformation)

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