

## Mathematical analysis II — Tutorial 7

<http://kam.mff.cuni.cz/~tereza/teaching.html>

*Problem 1:* Determine the volume below the graph of the function  $f(x, y) = 3 - x - y$  above the area bounded by  $x$ -axis and lines  $x = 1$  and  $y = x$ .

*Problem 2:* Using multivariable integral, determine the area of a shape bounded by curves  $y = x$  and  $y = x^2$ .

*Problem 3:* Can the following functions be continuously extended to  $\mathbb{R}^2$ ?

a)  $\frac{4xy^2}{x^2+y^2}$ .

b)  $\frac{y}{x}$

c)  $\frac{\sin xy}{x^2+y^2}$ .

## Mathematical analysis II — Homework 7

**Due: 9:00, 10.4.2019**

Write your solution of each problem on a separate sheet of paper of format A4, without torn edges. One part will be marked for credit.

*Problem 1:* Solve problems 8.41 and 8.42 from:

[http://etananyag.ttk.elte.hu/Files/downloads/4a\\_GemesSzentm\\_MathAnExI.pdf](http://etananyag.ttk.elte.hu/Files/downloads/4a_GemesSzentm_MathAnExI.pdf).

*Problem 2:* Determine the volume of the body

$$M = \{(x, y, z) | x, y, z \geq 0, 3x + y \geq 1, 3x/2 + y \leq 1, x + y + z \leq 1\}.$$

*Problem 3:* Find continuous extension of  $\frac{\sin x + \sin y}{x + y}$  to  $\mathbb{R}^2$ . Hint: use a formula for  $\sin x + \sin y$ .