After the exam of 21.06.2016: Typical errors, comments etc.

At most 40 points (rather than 35) are given per question.

Question 1

Partial success: A valid proof of the condition $\nabla f(x_0) = 0$ (but the goal is not reached).

Reward: 25 points.

Clarification: the condition is necessary and not sufficient.

Question 2

Partial success: A valid proof that the graph of f has area 0 (but the goal is not reached).

Reward: 25 points.

Clarification: the condition is necessary and not sufficient for integrability; see 4c3 for a simple counterexample.

Partial success: A valid proof that the boundary of $\varphi(B)$ has area 0 (but the goal is not reached).

Reward: 30 points.

Clarification: you still need to prove that f is continuous almost everywhere.

Remark: the graph is only a part of the boundary (unless the function is continuous).

Remark: do not confuse continuity of the mapping $(x, y) \mapsto (x, y - f(x))$ with continuity of the function $(x, y) \mapsto \mathbb{1}_B(x, y - f(x))$.

Question 3

Fatal errors:[1]

$(h_1x_1 + \cdots + h_nx_n)^2 = h_1^2x_1^2 + \cdots + h_n^2x_n^2$;

$\langle h_1, x\rangle\langle h_2, x\rangle = \langle h_1, h_2\rangle\langle x, x\rangle$.

Question 4

Error: wrong explanation (or no explanation) of the coefficient "2": 5 points.

[1] It means, no points for this question!

Grades statistics

Total	Question 1	Question 2	Question 3	Question 4
120		40	40	40
120	40		40	40
105		25	40	40
95	25	30		40
80	0	40		40
80	0		40	40
80	0		40	40
75	0		40	35
75	25	15		35
70		0	30	40
70	15	25		30
65	25			40
65	25	0		40
65		25	0	40
60		25	30	5
60		20	20	20
60	10	10		40
60	0		27	33
47	0	7	40	
45	0	10		35
45		15	15	15
43	33	10	0	

and so on...