

**After the exam of 07.02.2016:
Typical errors, comments etc.**

QUESTION 1

If f exists...

ERROR: proof valid for measurable A only.

PENALTY: 5 points.

If A is negligible...

ERROR: A is contained in a negligible open set.

CLARIFICATION: Open set cannot be negligible, unless it is empty.

PENALTY: 15 points.

ERROR: $f(x)$ is infinite for $x \in A$, but $\lim_{y \rightarrow x} f(y)$ is not.

PENALTY: 15 points.

ERROR: the limit is infinite — not explained why.

PENALTY: 3 points.

ERROR: the open sets are a decreasing sequence — not explained why.

PENALTY: 2 points.

QUESTION 2

ERROR: not enough explanations (about scaling, change of variables, why measures of intervals).

PENALTY: 1, 2, or 3 points.

Item (a)

ERROR: Measures are treated as functions; integrals are indefinite.

PENALTY: 20 points.

QUESTION 3

Item (a)

ERROR: First the scalar product, afterwards integrability.

CLARIFICATION: Existence of the scalar product is not guaranteed yet.

PENALTY: 3 points.

ERROR: Tonelli/Fubini not mentioned.

PENALTY: 2 points.

Item (b)

ERROR: The indicator function is $f \otimes g$.

CLARIFICATION: No, it is a limit of linear combinations of these.

PENALTY: 10 points.

ERROR: The indicator function is a finite linear combination of $f \otimes g$.

CLARIFICATION: No, it is a limit of such combinations.

PENALTY: 5 points.

Item (c)

ERROR: Completeness not proved, only orthogonality.

PENALTY: 6 points.

QUESTION 4

FATAL ERRORS:¹ Riemann integrability is not proved;
convergence theorems for Lebesgue integral applied to Riemann integral.

GRADES STATISTICS

Total	Question 1	Question 2	Question 3	Question 4
106		40	35	31
105	30	40	35	
105	30	40	35	
90	28	37	25	
80	15	38		27
77	20	37	20	
65	10		20	35
60		39	21	0
46	15		31	
24	10		14	0
20	10	10		0
20	10		10	0
17		0	17	
15	15	0		0

¹It means, no points for this question!