

After the exam of 24.01.2016: Typical errors, comments etc.

QUESTION 1

Item (a)

ERROR: $\langle \gamma, \gamma' \rangle$ is not replaced by 0.

CLARIFICATION: $(|\gamma|^2)' = 2\langle \gamma, \gamma' \rangle$.

PENALTY: 10 points.

ERROR: no (valid) proof that M is a manifold.

PENALTY: 5 points.

ERROR: the integral is not calculated.

PENALTY: 5 points.

ERROR: not shown how is the integral calculated.

PENALTY: 2 points.

Item (b)

ERROR: Dimension of M_1 is not taken into account when calculating J_ψ .

CLARIFICATION: this is similar to the cone (2d18); there, the dimension n of M_1 matters, since (by 2c32) J_ψ is proportional to λ^n .

PENALTY: 10 points.

QUESTION 2

FATAL ERROR:¹ $\operatorname{div} \nabla f$ is integrated instead of ∇f .

CLARIFICATION: $\operatorname{div} \nabla f$ is irrelevant.

QUESTION 3

FATAL ERRORS:² 3-dimensional chart of a 2-dimensional manifold;
3 vector arguments of a 2-form.

PARTIAL SUCCESS: The 3×3 matrix is calculated (but the goal is not reached).

REWARD: 7 points.

ERROR: no explanation why the vectors are an orthonormal basis of the tangent space to the sphere.

PENALTY: 2 points.

QUESTION 4

PARTIAL SUCCESS: $\int_U df \wedge dg = \int_{\partial U} g^{2015} dg$ (but the goal is not reached).

REWARD: 15 points.

¹It means, no points for this question!

²It means, no points for this question!

GRADES STATISTICS

Total	Question 1	Question 2	Question 3	Question 4
120	40	40		40
115		35	40	40
81	28		38	15
77	30	40	7	
70	25	40		5
47	30		7	10
42	17		0	25
40	25		0	15
40	18		7	15
35	20			15
27	20		7	0
25	15		10	
17	10	0	7	
10	10		0	0