

Final evaluation preparation

Pset	Prob	Pset	Prob	Grad?	Likeli hood	Original mark	Understanding at 3? (yes/no)	Description
1	1			Grad	0			LaTeX
1	2				1			Stereographic projection
1	3				2			Resolutions
1	4				2			Taylor polynomials
		2	1		3			C-infinity is a functor
		2	2		2			Diffeomorphisms induce isomorphisms
		2	3		2			Quotient spaces
		2	4		2			Orthogonal complement vs quotient
		2	5		1			Cutoff function
		2	6		1			No polynomial or rational cutoff
		2	7		2			Taylor remainder for cutoff
		2	8	Grad	2			Decomposable tensors
		2	9		1			Total derivative of a tensor product
3	1				1			Compute sign of a permutation
3	2				2			Evaluate a wedge product
3	3				0			Expand a wedge product
3	4				2			Compare wedge and cross products
3	5				3			Compute powers of a 2-form
3				Grad	1			Pfaffian
3	6				2			Pullback and d of a form
3	7				3			grad/rot/div vs. de Rham
3	8	4	1		1			Derivations on R
		4	2		1			Poincare lemma
5	1	4	3		3			$H^1(\mathbb{R}^2 - \{0\}) \neq 0$
5	2				1			Maxwell's Equations part 1
5	3				1			Maxwell's Equations part 2
5	4				1			Conservation of charge
5	5				3			Existence of electromagnetic potential
5	6				3			Ambiguity in electromagnetic potential
5	7	6	1		1			Quadruple intersections of hemispheres
5	8	6	2		2			Nerve of hemisphere cover
		6	3		1			Atlas of a single chart
		6	4		3			Compatibility of atlases
		6	5		3			Diffeomorphic atlases
		6	6		1			Normal vector to alternating map
		6	7		2			Alternating map to orientation
7	1				0			Orientation to normal vector field
7	2				3			Transformation law for n-form
7	3				2			Zero set independent of coordinates
7	4				1			Orientations of balls
7	5				2			Non-orientability of Mobius strip
7	6				2			Mobius strip in Klein bottle
7	7			Grad	3			Extension by zero
7	8				2			Why we need to contain supports
7	9				3			Tangent and cotangent vectors on $S^2$
		8	1		2			Orientations and elementary transformations
		8	2		3			Constructing a cotangent vector
9	1	8	3		1			Derivations from vector fields
9	2	8	4		1			Vector fields from derivations over R
9	3				2			Riemannian length of a path
9	4				2			Orthogonal vectors on sphere
9	5				2			Riemannian volume of sphere

Your goal should be to demonstrate a 3-level understanding to as many problems as possible. In case you need to focus your study, I have given a rough indication of the likelihood that I will ask about each question. Of course in practice, I will only be able to ask about a few questions. Although I won't expect any lengthy computations, I might ask for a summary of how a computation goes.