

There were 24 scripts in total. As usual, marks were out of 100; before scaling (and which I will not be told about) the highest and lowest marks were 87 and 20 respectively. The median mark was 68; the mean was 64 with a standard deviation of 18.

- 1h: A few students instead gave a cell structure for $\mathbb{R}\mathbb{P}^2$.
- 1j: Several students mentioned that if V is a \mathbb{F} -module, then V is a free \mathbb{F} -module. Thus $\text{Ext}_{\mathbb{F}}(V, \mathbb{F}) = 0$. That is true, but not relevant; the kernel mentioned in the UCT is $\text{Ext}_{\mathbb{Z}}(V, \mathbb{F})$.
- 2b: Strictly speaking, to justify the fact that v^* is the identity element of the \mathbb{Z} -algebra $H^*(S^2, \mathbb{Z})$, you need to appeal to the isomorphism of singular and cellular cohomology. (Or give some other justification.) No marks were deducted for skipping this.
- 3c: My solution used the Mayer–Vietoris sequence for reduced cellular homology. A few students instead used the long exact sequence for the pair $(S_{g+1,1}, S_{g,1})$; this is a cleaner solution!
- 3d: Freeness of the approximating groups, and injectivity of the homomorphisms, does not suffice.
- 4c: Several students used the long exact sequence for the reduced cohomology of a pair to deduce that $H^0(V, \partial V; \mathbb{Z}) \cong \mathbb{Z}$.
- 4c: A few students made a mistake of “unnatural” proportions: they defined the relative cochain groups by dualising and then taking a quotient.
- 4d: Poincaré duality is not just a good idea; it is in the name of the course!