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Feedback on MATH35001 exam Jan 2018

Q1: (a) & (b) were mainly fine. Lots of students didn't even attempt part (c).

Q2: Generally fine; some students got elasticity and viscous fluids confused. Virtually everybody lost one point for not showing that the continuity equation remains unchanged when written in non-dimensional form (even though I'd specifically asked for the FOUR PDEs).

Q3: Terrible! The words "where U is a constant that is to be determined" mean that you have to determine it. To reinforce that point I said explicitly in part (b) that you have to "recalculate U". Yet hardly anybody bothered to do either. I am speechless how many (third/fourth year!) students wrote the area element in cylindrical polars as $dA = dr d\phi$ (or worse...). This is first year material!

Q4: Generally fine. If I ask you to check that the continuity equation is satisfied you can bet your bottom dollar (or Euro) that I'll award points for doing this (and withhold them if you don't...).

Q5: The interface with the inviscid fluid confused (and probably intimidated) lots of people. I had dropped a not-so-subtle hint about this when saying things about the exam in the final lecture but this obviously got lost... Marked this very generously (more so than I should have) if people reverted to the no-slip condition (thus replicating verbatim what I'd done in the lecture) and was extremely sympathetic to anybody who at least realised that this wasn't the right thing to do. Was equally over-generous with some very woolly arguments about linearity and dimensional consistency and almost certainly awarded more points than I should have to badly memorised answers that didn't really make that much sense in the present context.