Fundamentals of Fluid Mechanics B Questions and Answers

Question by AME536A Student

I have a question about prob#1 in the assignment of 8. Can I define δ as the difference between the two symmetric inflection points of u?

This is not the best way of doing it because it will measure much less than the jet height. The Q&A is finished for this term: the exam is in less than 24 hours. Good luck!

Question by AME536B Student

Dr. Parent, any idea when will you be adding the final grades to UAccess?

I added them already more than 1 week ago. Let me check why you can not see them.

Question by AME536B Student

Will homework submissions be physical again or via D2L?

They have to be submitted in class on the due date, not on the D2L.

Question by AME536A Student

I can't make it to office hours today but I have a question about HW3Q4. I worked through mass and momentum conservation to achieve the following equation:

$v_\theta = -v_\theta ln(r) + C_1 r + C_2$

I then used the following boundary conditions: $v_\theta = 0$ at $r = R_2$ and $v_\theta = \omega R_1$ at $r = R_1$ After solving for C_1 and C_2 and then plugging back into the above equation and solving for v_θ I didn't get the answer given on the assignment. I'm wondering if there is something wrong with my boundary conditions or if my error is in my equation? Thank you for your time!

There are 2 ways to solve this problem. One which is not exact but close enough (the first answer given) and the other which is exact and does not get rid of any term (the second answer given). However, your expression for v_θ does not match any of the 2 solutions. The error is thus in the process of finding v_θ.

Question by AME536B Student

HW4, Problem 3A:

Looking at mom-con in y direction, is assuming that the body forces in the y direction are negligible a crummy assumption?

You should keep the gravitational effects within the y momentum equation.

Question by AME536A Student

Looking at problem 2 from HW5, I have some questions about order of magnitude analysis. In a previous example from class, we looked at the Stoke's Flow through a pipe with changing diameter. For this problem, we found u_s and v_s or the "scale velocities" in the x and y-direction. My question is, is this necessary for all order of magnitude analyses that contain more than one velocity vector?

In this case, I would not worry about scale velocities in x and y direction. This will make things more complicated then they need to be. You should rather start this by providing an order of magnitude estimate of the largest viscous terms (in any dimension) close and far from the sphere. So, the direction in which they point is not important here. Then, compare these approximate viscous terms to an approximation of the convection terms. Hint: focus on the length scales.