Fundamentals of Fluid Mechanics B Questions and Answers

You could do this as a first approximation but you should ultimately integrate fully the equations starting from rest till terminal velocity. And typeset properly your comments/questions using LaTeX please.

Question by AME536B Student

Can you give us the results for problem #3, so we can use them as a reference?

You can obtain a reference on your own using a simplified solution assuming no acceleration. When setting the height to a large value, both solutions (simplified and complete) will give the same answer for the time.

Question by AME536B Student

I have a question on problem #3 on HW #6. We can solve the Stoke's equations analytically, and using those solutions we can determine a Reynold's number to verify if the Stoke's solution is valid or not. Assuming that the Reynold's number becomes very small, can we say that the Oseen drag equation converges to the Stoke's drag equation? Obviously this wouldn't work when the Re approaches 1, but would it be considered an okay assumption for a very small Re?

No, you should solve for the Oseen equation fully. This will give a different solution than the Stokes solution and you need to determine this difference. Also, you should write you code or analytical expression in general form so it can be applied to any droplet size, not just those listed in the question.

Question by AME536B Student

Would it be too much to ask for the homework to be posted Thursday after class or Friday morning please? Most classes give you at least 1 week to work in homework problems. Thanks!

I think this assignment is significantly easier than the previous one, and can be completed in 4 days. The deadline is not changed. Besides, the 3 questions were already mentioned to you in class more than 1 week ahead of the deadline. You had plenty of time to work on them.

This thread is for questions related to solving the assignment not to try to delay the due date.

Question by AME536A Student

In homework 8.2, by total drag do you mean the skin friction drag or the skin friction drag plus the form drag (due to a pressure gradient)?

If you can calculate form drag plus skin friction drag accurately then do so. Otherwise provide best estimate.

Question by AME536A Student

In homework 8 question 1, can we assume an infinitely long plate in z, so that the derivatives in z vanish?

You can not make extra assumptions on top of those involved in deriving the boundary layer equations.