Heat Transfer Questions & Answers

Question by Student 201527136

Professor, I have question about fully-developed flow in pipe. You said the equation $\frac{U}{U_b} = 2\left(1 - \frac{r^2}{R^2}\right)$. Is this expression valid for both laminar flow and turbulent flow?

This is valid only for laminar flow.

Question by Student 201428239

Professor, I have a question about A7 of Q5. In this question, I need to use correlation of free convection H-T. I should use vertical plane correlation. In the table, a comment written as "x the distance from the bottom". In this comment, the x means height?? Then, when I use correlation ($Nu_x = C(Gr_x Pr)^m$, should I use $x = H$??

In this correlation, x is the distance from where the boundary layer starts.

Question by Student 201428239

Professor, I have a question about A6 of Q3. In this question, I know the value of q local and q average. Then, I can get the relation between Nu_x and Nu_L average. To solve (a), Do I need to compare these values and find the flow type??? If so, I can easily get Laminar flow, but in your comments, it could be either laminar or lam-Turb mix. How can find Lam-Turb mix relation??? Thank you

Well, by using a Nusselt number correlation that is suited to the turbulent/laminar regimes.

Question by Jaehyuk

Professor, I have a question regarding A7Q5. As far as I believe, it is suitable to use the correlation for a vertical plane with constant heat flux;
$Nu_x = C(Gr_x^* Pr_f)^m$. Here starts my problem. In order to find constants(C and m), the range of Gr_x^* has to be set first. However, when Gr_x^* is in between $1E11 < Gr_x^* < 2E13$, there is no option for constants(C and m). In this case, is it possible to choose any one of two options?

If you can't find a correlation that fit perfectly your situation, then choose the one that is the closest.

Question by Student 201428239

Professor, I have a question about A7 of Q5. In this problem, I should find free convection heat transfer coefficient. But in correlation, I should know T_s first. I can get T_s through iteration process. And then get h. Is this procedure correct?? Because in the problem, the order is to find h first and then find T_s.

Yes, exactly. I mentioned this in class.