Heat Transfer Questions & Answers

Question by Student 201427125

Dear professor professor said that assignment #2, #3, use iterative(?) process, but I didn't complete NUMERICAl ANAlYSIS. So what is iterative process?

You can read about it here:

https://bernardparent.ca/viewtopic.php? ... 6645#p6645

Question by Student 201227125

Professor, at fin problem, Wall and fin was contacted. but why does not consider contact resistance in solve heat rate q_x ? If wall and fin only one parts(not contact), we should define assumption that?

Yes, this would be an additional assumption if the fin and the base are separate pieces. But often they are welded together and there is no resistance. 1 point bonus.

Question by Student 201327106

Professor, in Fin Efficiency with non-insulated tip, you wrote

$A_m = tL, L_c = L + t/2$

I don't know why

$L_c = L + t/2$

If you work out the problem but impose a convective heat transfer BC at the tip, then you can show that $L_c = L + t/2$. Maybe I'll ask you this question in the midterm..

Question by Student 201327106

Professor, in shape factor example with heat generating hollow cylinder between two plates, you wrote

$q = SL\pi r_i^2$

But, I think

$q = SA = 2SL\pi r_i^2$

with radius

r_i

Thank you.

I don't understand your question. The heat generation is

$q = SV = SAL = S\pi r_i^2 L$

because A is the area within a circle of radius r_i .

Question by Student 201427103

Professor, I would like to ask you a basic question about one equation during your review of what you have learned so far about heat transfer.
In the process of producing an equation of Heat Equation , we suppose that voulme matter is at -rest . therefore we derive the equation of

$$\frac{\mathrm{d}\rho e}{\mathrm{d}t} = \frac{\partial \rho e}{\partial t} \ldots . (1)$$

(because matter is at rest)
In this equation, the question is : There are many variables such as location, time, and so on that function for density and energy. When the equation was differentiated with respect to time,

$$\frac{\mathrm{d}\rho e}{\mathrm{d}t} = 0 \ldots . (2)$$

because we suppose at -rest state .
As a result, I think that the reason for this equation (1) is (2) . Therefore, (1) I think that = 0 should be added to the equation. Is it exactly what I understand?

Well no, because the rate of change of the energy is not always zero even if the matter is at rest. It can change because of heat transfer or heat generation.

Question by Student 201327139

Professor, I think Assignment #2, Q.5 (a) has wrong answer.

If you don't mind, would you check it again please? Thank you.

I think it's better if you sleep over it and look again carefully into your logic and algebra tomorrow when your mind is more fresh..