Test 3 Reflections

This test covered various objectives in the heat transfer course. The unit of the test was about transient conduction and the objectives covered were: Solve steady one-dimensional heat conduction problems, multi-dimensional heat conduction problems, and unsteady heat conduction problems, Explain the physical meaning of dimensionless parameters and their relation to different heat transfer problems, and Use commercial computer programs to numerically solve heat transfer systems. For the problem on the test we had to solve it analytically and then numerically using COMSOL. The mistakes I made during the test were first not stating that I assumed Bi>.1 then solving for alpha. My process for finding convective heat transfer coefficient (h) was different because I assumed for biot number first when I should of assumed "h". I believe the largest mistake made was when I interpolated to biot numbers to find "h". The table that was needed to solve this problem didn't have small increments of biot numbers after 1 and the answer was somewhere between 1 and 2. I only interpolated between 1 and 2 for 1.5 and the answer was not close. I should have kept interpolating to find 1.07, which was the correct biot number instead of just 1. Because I kept the "h" that I got from the biot number that was off by .07 my answers for temperatures at the surface and temperature at the half radius were also incorrect by a~4 degrees. Because of those errors I received the same answers in COMSOL that were incorrect by small increments. If I were to take the test again I would of kept interpolating the biot numbers until I obtained a close enough answer. Most of my interpolations are

usually within .5 increments where I only have to interpolate between 2 given points of the table but I haven't interpolated large gaps like 1 and 2 to solve for 1.07.

If I were to grade my test I would give myself a B+. I learned that iterations and solving for unknowns are a great tool to use in engineering and if we are familiar with spreadsheets like excel then solving for iterations become easier. I believe engineers that are in the heat transfer field or fluid mechanics field use the program COMSOL quite frequently whether for industry use or research. I think no matter what field of engineering I go into I will encounter problems using heat transfer. Because COMSOL is such a powerful tool for solving heat transfer I could see engineers using it to solve problems in their field. I have applied concepts in this course for the FE that I am currently studying for. I feel like I improved most in using COMSOL especially since the last time I used it for test 2. I can see this course intersecting my field if I am asked to solve a heat transfer problem, in which using a program like COMSOL would be very efficient to solve these kinds of problems.