Test 2 demonstrated work toward several of our course objectives. We had to show a comprehensive understanding of thermodynamics by using the skills we learned in class and applying them to the different parts of this test. We also had to think critically about what we had learned and draw on our problem solving skills to tackle the objectives presented. For the material on this test we specifically had to apply knowledge of the rankine cycle with regeneration and apply it to a steam power plant, as well as display our knowledge of the basic operations of vapor cycles. Because this had one schematic and several facets, I will go through and critique my work in each part (a, b, c, etc) as opposed to one giant section for 'Problem 1'.

Part g)

Like Dr. Ayala, after I found all states I chose to first find mass fraction y_1 and y_2. I used a similar set up to find the mass fractions, but it appeared that I did not total up all of the mass flow correctly. I chose to focus on the feed water heater but multiplied the enthalpy at the exit with the supposed mass flow when I shouldn't have. This resulted in a higher value than the correct one. Going back I would urge myself to spend more time setting up the formula for finding the mass flow and do a better job studying smaller portions of the calculations like that. Because I started with this it subsequently affected calculations that included mass flow rate.

Part c)

For turbine work I did not account completely for each part of the mass flow and also, for certain sections, chose to simply use the enthalpy at each state instead of using the difference of enthalpies before and after. This resulted in a slightly lower value for my turbine work. Also my value for mass fractions may have contributed to the erroneous nature of my final answer. If I could go back I would tell myself to take my time in figuring out the correct equations for getting the correct amount of mass to multiply with each value for enthalpy. I would also remind myself to use the difference of enthalpies as opposed to just the value for enthalpy at particular points.

Part d)

While finding the mass flow rate for a 50,000kW load my only error was using my value for turbine work as opposed to the correct one which resulted in an incorrect answer.

Part h)

For this portion I messed up and found q_{in} as opposed to Q_{in} first. After I found this value and realized my mistake I figured I had to use it but I did not. I also calculated it using the wrong values for enthalpy and the wrong equations for mass flow rate. I did have a somewhat similar set up (multiplying mass flow rate with enthalpy on either side of the condenser) but at the end of the day it was not entirely correct. I would tell myself to slow down for this part especially considering I was doing a similar calculation right next to it. I would also counsel myself to take more time figuring out the exact mass flow rates.

Part e)

For this part I did not multiply the mass flow rate by the difference of enthalpies and instead just did the difference in enthalpies.

Part a)

For this portion I used the correct set up but I believe the fact that some of my values were wrong leading up and my answer was subsequently affected which resulted in the wrong value. I also believe that I may have made an error in factoring in mass flow rates in different parts of the system. Going back there wouldn't have been much to caution myself against other than making sure my equations for mass flow are correct.

Grading

Writing	
Purpose	.5/10
Drawings	1/10
Sources	1/10
Design Considerations	.9/10
Data and Variables	.4/10
Procedure	1.8/10
Calculations	1.5/10
Summary	.5/10
Materials	.5/10
Analysis	.8/10
TOTAL	**8.9/10**

Problem 1	
Actual Cycle Diagram	1/14
P-v and T-s Diagrams	2/14
State Calculations	1.8/14
Double Interpolation	0/14
Calculate y_1	.7/14
Turbine Work	.8/14
Mass Flow Rate	.9/14
Heat Rate-Space Heating	.7/14
Heat Released-Condenser	.6/14
Utilization Factor	1.8/14
Final Results	.8/14
TOTAL	**11.1/14**

Final Grade: 8.9+(80)x(11.1/14)= 72.33%

The grade I would give myself would be 72.3%. I believe that most of my initial set ups for the problems were solid but the fact that my preliminary values were slightly off coupled with my mistakes while factoring in mass flow rates threw my answers off a fair deal. If I could go back I would tell myself to spend more time studying how to get the mass flow rates (setting up the equations). I would also tell myself to be a bit more organized while going through the problems and also focus more on obtaining the correct values with the correct set-up the first time to avoid having to go back and re-calculate over and over.

I have learned a lot more about the inner workings of power plants and different systems through this test. I have also seen the importance of a proper set up of the system, the states, and each part of problem. Staying organized is paramount when dealing with a large problem such as this. I have also found the value in taking my time and allowing myself plenty of time and opportunity to understand and work through the test. Additionally, I have been able to see how if you want to improve this type of system it is most beneficial to focus on the turbine, and learned more about how we can use the information provided/how to use the values you calculate to extract meaningful information about the states and different part of the system to make educated guesses and design improvements.