Question 1

Test 1 demonstrates my work to several of the specified course objectives, primarily how to develop an intuitive understanding of how to apply the first and the second law of thermodynamics to different thermal systems, apply thermodynamics laws to gas turbines Engines using ideal cycles, reheating regeneration, and inter-cooling cycles and apply thermodynamics laws to Jet Propulsion Engines using ideal cycles. Both of the test problems required knowledge and application of the first law of thermodynamics. The first problem focused on the set up and solution of several different Brayton cycle scenarios. The second problem involved solving for a jet propulsion engine.

Question 2

Most of my solution matches the provided solution and the final answers are either the same or very similar, however there are a few small differences. The final answers for each desired value do not exactly match , but that is most likely due to rounding differences since they are very similar, but it could also be due to a mistake I made somewhere when calculating. The process for the first problem appears to be the same as the solution, however the solution for the second problem varies slightly. The P-v diagram I drew varies slightly from the solution because I put the alternate isentropic state of the turbine at state four instead of state five, which is what caused my solution to look different. Beside that, all of the values calculated look the same or similar, with the biggest difference coming from the value for enthalpy at the actual stage five, which causes the nozzle exit velocity and engine thrust to be greater than the given solution. This could be because I calculated something wrong, I used a different value that was found from the table, or I just rounded differently. Another section of my solution that could use improvement are the procedure and analysis discussions, which I know I can make more well rounded and thorough if I allow myself more time for those sections for the next test. Overall, what I would do differently when approaching the next test is to start earlier, make sure I have a clear understanding of the elements of the given question and how that affects my solution, and allow more time for the written portion of the test.

Question 3

Based on the test rubric, I would give myself an 93.5 for Test 1. I would take off one point for the procedure (1.0/10.0), 0.5 points for the analysis (0.5/10.0), and 1 point for the P-v and T-s diagrams for the second problem (1/8). My strengths for the test were knowing the overall equations and relationships to use as well as getting the final answer. My weaknesses were in the writing and description portions of the test and some of the smaller details of the problems.

Question 4

a) I had some issues with time to complete the test, because it took longer than I expected, so I had to rearrange when I did some other assignments to allow for my mistake. I also had some trouble starting the second problem of the test and it took me a considerable amount of time to realize how to set it up and where my original mistakes were. After reviewing some of the homework assignments, I was able to get on the right path.

b) I completed the test all in one sitting for the most part, which is why I think I got kind of stuck on the second problem because I didn't allow myself time to get stuck and be able to really think through a problem instead of having to rush and panic when I get stuck. I would definitely start earlier and think through the problems and what I write for the test more.

c) I have learned several different ways to approach a Brayton cycle and how different elements affect the outcomes. I also learned how to solve a turbojet problem and practiced using equations for variable specific heat values and non-isentropic processes.

d) Engineers use these concepts in several different applications. Obviously these concepts can be used for Brayton cycles and turbojet engines, but concepts like the first law are used in countless engineering problems, and it is vital information to know how to use and understand, because if you don't understand it you don't understand the problem.

e) I will definitely use the information from this test, both the content and method of approaching problems, on the future tests and homework assignments as well as assignments for other classes. When I start my career, if I am working with engines or turbojets I will definitely use this information, and if not I will still use the basic concepts and approaches to whatever systems I work on.

f) Yes I think what I have learned from this test is very important to my career. I am learning how these different systems function and how the elements of the equipment relate to solving problems for it and what certain information about a system gives insight into how it will or should behave.

g) These skills will be used in the rest of my academic career and my future professional career.

h) Yes, the concepts I am learning in this course most certainly relate to my other courses and the concepts and methods I have learned from this class I apply to my other classes to help me solve the problems and vice versa.

i) I feel I was most successful in setting up the problems and knowing what equation pertained to the questions, I think I am most improved on knowing how a system functions based off of the problem statement and what that information means for the problem solution.

j) I am not sure what I would like to first do in my professional career yet, but I know that so many mechanical engineering systems are centered on heat and work, and so I am confident that whatever I decide to do, I will definitely need the knowledge that will come from taking this class in order to succeed.

k) I spent three days doing this test, one of which was the entire day, which was more time than I was anticipating. I was busy with other assignments and midterms when the test problems were first released, so I waited until the last three days of the test being available to really sit down and work on the problems, which was a mistake because I do not feel I gave myself enough time to provide a thorough enough solution or to properly check over my solutions to make sure they were fully correct.