Chris Betton

1) How and why the test demonstrates your work toward one, or more, of the course learning objectives. Be specific on the course objectives you decide to mention.

Test 3 demonstrated multiple course objectives. This includes computing pressure, friction losses in piping and analyzing fluid dynamics in pipes and fittings. In test three I had to compute friction losses, find Use my knowledge of fluid dynamics to find the required pump power to transfer water from a tank through a heat exchanger.

2) How your test compares against the available solution. State the mistakes you made and what you will do next time to avoid making same mistakes. Please point out exactly where you made the mistake, say why you made the mistake, and how you should have done it. If you were taking this test again, what advice would you give yourself to ensure that you had a successful test?

If I could give myself advice after taking this test I would say, start earlier and review the lecture notes. In comparing my solution to the rubric, I see that I incorrectly implemented the iterative process. I also did not correctly manipulate Bernoulli's equation. Elevations should not have been cancelled because the tanks were at different heights. I did set up my energy losses equation correctly but made a math error.

My biggest mistake was not using excel to correctly iterate to find friction coefficient and volumetric flow rate. I should have guessed friction coefficient at A, B, C and D. Then Computed Qc and Qd by analyzing the % difference between the right and left side of the rearranged equation for Q. Finally after computing the Reynolds number at point a,b,c, and d I should have recalculated friction coefficient and compared it to the guessed value of friction coefficient.

3) What your grade should be. Base it on the writing rubric provided in the test and the correctness of your solution. What are the strengths and weaknesses of your test?

1. PUMP HEAD

a.	Initial setup – labeling, reference, points	1/5 out of 1/5
b.	Appropriate use of Bernoulli's to solve for hA	1/5 out of 1/5
c.	Compute all 11 energy losses	1/5 out of 1/5
d.	Compute pump power	0/5 out of 1/5
e.	Correct final results	0/5 out of 1/5

2. TOTAL FLOW RATE AFTER OPENING VALVE

- a. Setting up the equations (2 eq from Bernoulli) 1/7 out of 2/7
- Pa IS ZERO. WHY ARE THE ELEVATIONS CANCELLED? TERM OF HX IS NOT CORRECT.
- b. Consider ALL energy losses in each branch 0.75/7 out of 1/7

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NOT ALL OF THEM WERE PROPERLY CONSIDERED.c. Setting up the iteration process0.5/7 out of 1/7WRONG EQS0.5/7 out of 1/7d. Solving the equations using excel0.5/7 out of 1/7WRONG EQS0.5/7 out of 1/7e. Tried all valve opening cases0.5/7 out of 1/7DID NOT0/7 out of 1/7

FINAL GRADE:

 $(90/2)^*(3/5 + 3.75/7) = 52$

During this test I did not understand how flow rate would be different at various points in the system. I could have analyzed the system in chunks instead of looking at the system from beginning to end. While working on this test I tried to follow along with the lecture as I solved the problems. Instead of using the concepts from the lecture and applying them to the specific problem presented in the test, I tried to use the equations as they were developed in the lecture. This did not work because the problem in the test had very different characteristics than the problems in the lecture. After reviewing this test, I feel that I have a better understanding of how to iterate to find an appropriate flow rate in a system. The concepts in this test are important because they show how a bypass valve can affect the flow rate through different branches in a system. I was most successful in calculating the minor and major losses in the system. There is always room for improvement and one thing I could improve upon in this matter is being more organized in my work. I would be able to save a lo of time if I used a chart to organize values related to multiple components. In this test, there were 11 values for minor/major losses that needed to be evaluated. I got disorganized with this part and wasted a lot of time trying to interpret my written work. I was least successful in using the iterative process. One way I can improve upon this is practicing using the provided solutions. I understand the process but have not dedicated enough time to be able to develop an iteration in a timely manner.