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MET330

Test Reflection 3

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.

a. In this test I:

- i. Applied the principles of conservation of energy (Bernoulli's equation) and mass to fluid flow systems via part 1 of problem 2 where we were required to find the pressure drop between two points of a pipe.
- ii. Computed friction losses in pipes for a variety of configurations (series, parallel, network, etc.) through part 2 of problem 2 where it is required to find ALL energy losses (thus including friction) in order to compute the flow rate at the end of the parallel pipe.

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?

- a. My test is almost exactly as the solution. The only mistakes I made were minor rounding ones. My answers were only wrong by a small margin and my process was correct the entire way through. I believe this difference is caused by different assumptions and is not incorrect as different reasonable assumptions were taken as opposed to the solution.

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?

a. PROBLEM 2

- i. Reasonable assumptions (reductions, valve, tubing diam, lengths)

1. 1/10 out of 1/10

- ii. Apply Bernoulli twice or get 2 equations from Bernoulli

1. 1/10 out of 1/10

- iii. Consider ALL minor losses? Handled them correctly?
 - 1. 2/10 out of 2/10
- iv. Handled correctly the pipe losses?
 - 1. 1/10 out of 1/10
- v. Obtained 3 equations with 3 unknowns?
 - 1. 1/10 out of 1/10
- vi. Solved system of equations correctly (Excel)?
 - 1. 3/10 out of 3/10
- vii. Final results
 - 1. 1/10 out of 1/10
- viii. TOTAL
 - 10/10 out of 10/10
- ix. FINAL GRADE:
- x. **(90)*(10/10) = 90**

4. Discuss the following:

- a. **What issues did you encounter in completing the test? How did you troubleshoot them?**
- b. **What steps did you take to complete the whole test? Would you change something?**
- c. **What new concepts have you learned?**
 - i. I learned how to compute the energy losses and flow rates for various configurations of parallel pipe as well as a way to iterate and find solutions to a system of equations for parallel pipe configurations specified by applied Bernoulli's equations.
- d. **Where you think engineers use those concepts (provide specific examples)?**
 - i. Engineers certainly use these concepts when designing firefighting systems such as overhead sprinklers, piping systems such as sewers and water delivery systems. Parallel piping systems are extremely important, and I believe it would be almost impossible to have a career in fluids without encountering a parallel system.

- e. **Where do you think you will be using everything you learned?**
 - i. I will definitely use it in my career revolving around fluids and in the industry designing efficient and safe systems is very important which means that it will be a critical point of learning going forward.

- f. **Do you think what you learn is important for your professional career?**
 - i. Seeing as I want a career in fluids, yes, it would be critical to my success as an engineer.

- g. **How, when, where and why you might use this information or skill in the future?**
 - i. I will use this information in my career or perhaps even in designs of small systems for personal uses.

- h. **Have you been able to apply concepts you have learned in the course to what you do at work or in other courses?**
 - i. Not this test's in particular, but the contents of the course have been extremely beneficial in Thermal Applications, where understanding the relationship between compressed liquids and thermodynamic cycles can greatly simplify the Compressed Liquid Approximation.

- i. **What areas did you feel you were most successful, or improved the most?**
 - a. I definitely improved in the area of being more careful in rearranging equations and iterations. The iterations were not so challenging at first, but the setup was posing me problems. Now that I have a firm and solid grip on the setup and iteration process, I am confident that I can solve these problems moving forward.

- j. **How do you see this course's content intersecting with your field or career?**
 - a. As stated earlier, this course is the foundation of my entire career, so the concepts presented here are mission-critical to my success as a mechanical engineer.

- k. **How much time did you spend on the test? How was the time organized? What would you do differently? Why?**
 - a. I spent a small amount of time on the first part since it came natural after all the practice that we had during the class via problems and homework. The second part was a bit more challenging because I did have to rewrite the equations multiple times in order to verify their accuracy. This took about two

hours spread over five days, but it was not so hard. The total time was two hours spent manipulating Bernoulli's equation. Moving on to the final part, the iterations, it did take me a significant time in setting it up and verifying the accuracy and sensibility of the solutions. I spent about an hour setting it up and three hours verifying the legitimacy of every formula, manipulation, and method that I used. These times were spread over the test period so the time was not overwhelming, probably about an hour a day.

- b.** Overall, the test was not difficult, but the verification process took a long time due to the high amount of error that was possible. Even a single dropped negative sign would impact my solution adversely, so I ensured everything.