Ben Smithson Fluid Mechanics Test 2 reflection

1. Overall, the test went alright but I did mess up on the process in some cases. I got confused about the process of problem 2 and seemed to not grasp the use of the excel sheet from the last test. There are plenty of improvements I can make for the next test and future endeavors in the workforce including the use of the excel spreadsheet for a quicker result.

2.

WRITING RUBRIC (Applied to the whole test, not to particular problems)

1.	Purpose	0.5/10.0 out of 0.5/10.0
2.	Drawings	1.0/10.0 out of 1.0/10.0
3.	Sources	1.0/10.0 out of 1.0/10.0
4.	Design considerations	1.0/10.0 out of 1.0/10.0
5.	Data and variables	0.5/10.0 out of 0.5/10.0
6.	Procedure	2.0/10.0 out of 2.0/10.0
7.	Calculations	2.0/10.0 out of 2.0/10.0
8.	Summary	0.5/10.0 out of 0.5/10.0
9.	Materials	0.5/10.0 out of 0.5/10.0
10.	Analysis	1.0/10.0 out of 1.0/10.0
	TOTAL	**10.0/10.0** out of 10.0/10.0

1. Force on the flange
    1. Consider piezometric head (get pressure above fluid) 1/25 out of 1/25
    2. Force magnitude 0.5/25 out of 1/25
    3. Force location 1/25 out of 1/25
2. Pipe-elbow forces
    1. Free body diagram and correct forces 1/25 out of 1/25
    2. Force in x – solve for Rx 0.25/25 out of 1/25
    3. Force in y (weight) – solve for Ry 0/25 out of 1/25
3. Flow-nozzle flowmeter pressure drop
    1. Right equation and A1/A2 0.5/25 out of 1/25
    2. C value 0.5/25 out of 1/25

4. Water hammer pressure increase and cavitation
    1. Wave velocity (units?) 1/25 out of 1/25
    2. Pressure increase and Pmax 1/25 out of 1/25
    3. Pipe thickness 1/25 out of 1/25
    4. Lowest pressure & compare to sat pressure (cavit) 0/25 out of 1/25
5. Flow in the open channel
    1. Lazy river dimensions 1/25 out of 1/25
    2. Correct equation 0.5/25 out of 1/25
    3. Area and hydraulic radius 1/25 out of 1/25
6. Drag force on the child
    1. Correct equation to use 1/25 out of 1/25
    2. Correct area and velocity 1/25 out of 1/25
    3. How Cd was obtained? 0.5/25 out of 1/25
7. Lazy river tube floating – stability
    1. Realize Fb=W and solve for distance into water 0/25 out of 1/25
    2. Compute metacenter location 1/25 out of 1/25
    3. Realize metacenter will always be above cg 1/25 out of 1/25

8. Correct results? 2/25 out of 4/25

FINAL GRADE:

If getting everything right:

10 + (80)*(17.5/25) = 66

3. If I was able to go back in time and take the test again, I would tell myself to GO OVER THE EXAMPLES! This would have helped with the vertical and horizontal forces. Also, I would have gone over my excel sheet in order to make it easier on myself.

4. I have learned how important excel is as a calculator as well as how important it is to go over class examples. This would have improved my score and overall understanding for what was being asked of me on the test.

5. A. I had issues with simple calculation errors as well as selecting the correct formulas in some of the problems. I had to go into the textbook and examples in order to overcome some of the issues I had on the test. I also looked over previous videos released in the class.
   B. First I was able to complete the pretest for the fluids test. Then I started with the writing portion of the test in order to get going and to try and understand the question and what they are asking. Next I started the calculations but quickly realized that I needed to look at examples from the class and textbook to find out if I was doing each calculation correctly. Next I went through the calculations and checked my work.
   C. I have learned all new concepts in the first test. I did not know about how buoyancy was calculated as well as pressure loss. All of these concepts are new to me and interesting for the degree.
   D. I believe engineers will use the test question for pressure losses as well as for creating a scaffolding for this pipe system. Also, engineers will use this for a lazy river application.
   E. I believe I will be using these equations and systems in engineering if I ever work with companies that need to calculate pressures and flow rates as well as weight of the system. Examples can be with the fuel pressure in ship engines in the ship yard possibly or in a water park for the lazy river.
   F. I believe this question was important for the professional career of engineers and it was an interesting question overall. If it wasn't in a test format it probably would have been more enjoyable but it was interesting and I'm sure some of us will see something similar in our engineering career. The second question helped with showing how my individual design could work for a lazy river.
   G. I will use this information in my engineering career but understanding the basic concepts of energy loss and flow rate have already been incorporated in my life because

I understand that the pressure of water flowing through something like a sink will be larger than you think because of energy loss through the pipes which is very interesting to me. ALso, I will look at the lazy river differently next time I am at a waterpark.
H. I have been able to apply some of the concepts in this course to the thermal applications course. Now they are not exactly the same but both classes are dealing with pressure in a machine all of the time.
I. I feel most improved in calculating the design for the lazy river. I was able to grasp this concept the best.
J. As stated before these concepts will most likely show up in the engineering field depending on where we end up working.
K. I spent a total of around 20 hours on this test doing the pretest, calculations and looking in the book and in class examples for help.